AT Command Interface Specification

HiLo Modules

SIERRA WIRELESS

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Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Sierra Wireless modem are used in a normal manner with a well-constructed network, the Sierra Wireless modem should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Sierra Wireless accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Sierra Wireless modem, or for failure of the Sierra Wireless modem to transmit or receive such data.

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Document History

Version	Date	Updates
1	jj/mm/aaaa	Création du document / Document creation
2	20/09/2007	Corrections sur SMTP /Corrections for SMTP
2	04/11/2007	
3	05/11/2007	
3	01/02/2008	Add commands timeout Delete TAC for KCELL Delete +FAE Change KFLSH space to 2MB Add list of commands available without SIM card
3	05/02/2008	Remove UMTS bands in *PSRDBS
3	13/02/2008	Declare the KCELL parameter format(hex or decimal)
3	21/02/2008	Change +KCNXCFG parameter <nbmode> to string type
3	22/02/2008	Add IPR comments for autobaud Add CGACT comments
3	12/03/2008	Modify on AT+CALA
3	18/03/2008	Change Appendix 5 - title
3	25/03/2008	Modifications on AT+KADC
3	26/03/2008	Modifications on AT+CRSM
3	01/04/2008	Modifications on AT+KADC
3	03/04/2008	Modifications on AT+KPWM
3	07/04/2008	Modifications on +CRSM Add +CSIM
3	07/04/2008	Modifications on +KGPIOCFG
3	21/04/2008	Add +CRSM example
3	23/04/2008	Update FTP reply codes
3	25/04/2008	Update SMTP Specific Error Code; Modification on AT+KSMTPPARAM Modification on AT+KSMTPTO Cancel ETX checking for AT+KSMTPUL
3	25/04/2008	Modification of STK
3	29/04/2008	Modification KRIC : delete 0x20, mux07.10 wake mode (not supported)
3	03/06/2008	Replace the flash reading and writing command with KFSFILE command
3	05/06/2008	Remove mode 2 of AT+VIP
3	05/06/2008	Update the POP and SMTP Specific Error Code;
3	19/06/2008	Add 41 forgotten AT commands;
3	19/06/2008	Update TCP/UDP commands
3	23/06/2008	1.Add 13.3 End of Data pattern 2.Update 13.5 FTP Specific Commands for multi-session syntax and +KPATTERN 3.Update Appendix 7 HOW TO USE FTP Specific commands

Version	Date	Updates
3	24/06/2008	Update error code for KTCP_NOTIF and KUDP_NOTIF Update TCP/UDP examples in APPENDIX6、8.
3	24/06/2008	Remove SIZE param for +KFTPRCV and +KFTPSND
4	24/06/2008	Update syntax of POP3 at command. Update sample of POP3 usage.
4	16/07/2008	Update a syntax error in psrdbs : DCS1800 instead of PCS1800
4	04/08/2008	1. Add new command “KCGPADDR” and update example of TCP Server. 2. Update syntax of “KPOPLIST?”
4	05/08/2008	1 Change title of +CGSMS 2 Modification of explanation of <cid> field for +CGDATA 3 Add explanation for <cid> of +CGDCONT
4	06/08/2008	Modify response of +CTFR
4	11/08/2008	Add max size of KPATTERN
4	25/08/2008	Modify +KFTP ERROR to +KFTP_ERROR
4	26/08/2008	Add FTP Server command
4	23/09/2008	1. Add flash file download/ upload feature for ftp client. 2. Add flash file download/upload example for FTP client example. 3. Add new ftp error code for flash access trouble.
4	25/09/2008	1 Add +CGEQMIN/+CGEQREQ/CGSMS 2 Delete +KSGV 3 Correct some mistake.
4	09/10/2008	Add MMS AT commands
4	10/10/2008	Modification on CRES/VTS/KCNXCFG
4	15/10/2008	Modification on ATO Add example for MMS
4	16/10/2008	1.Add DTR/AT&D/+++ description for +KFTPRCV and +KFTPSND 2.Add server IP parameters for +KFTPDRUN
4	17/10/2008	1 Modify the note of command KSMTPUL. 2 Modify the sample code of SMTP and POP3 3 Update command format of FRS and FTS
4	22/10/2008	Update the command KFSFILE
4	28/10/2008	Add APPENDIX13 Correct some mistakes in advanced cmds.
4	28/10/2008	Modify CSGT command
4	28/10/2008	Modify Appendix 13
4	30/10/2008	Remove “new” and “new2” words Remove CGEQMIN and CGEQREQ (3G) Change SA to COMMUNICATIONS Change logo
4	07/11/2008	Add SMS table for +CPMS
4	13/11/2008	Add some information for +KFSFILE
4	18/11/2008	1. Add memory full error code for ftp flash download. 2. Add how much session for ftp user and ftp server. 3. Add how many user connections for ftp server. 4. Add ftp server example. 5. Correct several errors.
5	20/11/2008	Change MUX capabilities
5	20/11/2008	Add description for DTR/+++ for SMTP/POP3

Version	Date	Updates
5	08/12/2008	Modify syntax of POP3 command in sample.
5	09/12/2008	Add antenna detection command +KGSMAD
5	12/12/2008	“/ftp” is the only valid URI for ftp server root directory.
5	19/12/2008	Delete*PSINFN; Add KMCLASS Modification on KSLEEP Modification on KGSMAD
5	22/12/2008	Modification on CRMP
5	06/01/2009	Add temperature monitor command +KTEMPMON
5	07/01/2009	Add SIM detection command +KSIMDET
5	16/01/2009	1.Modify +KFTPDEL 2.Add DCD and DTR description for ftp client
5	19/01/2009	Add notes for CGDATA Delete CRMC command Modification on CRMP KTCPCLOSE <closing_type>=0 not support
5	21/01/2009	Add note for CPIN? 30s answer if card extraction
5	22/01/2009	Add new AT cmd + KSYNC
5	26/01/2009	Change *PSSTKI explanation
5	09/02/2009	Modify the notes of +KSYNC
5	11/02/2009	Modify pattern things for TCP/UDP cmds
5	11/02/2009	Change the formula for BUZZER frequency and its range. See +KPWM
5	13/02/2009	Add new parameters for +KSYNC command.
5	14/02/2009	Add +KFILTER command
5	13/02/2009	Make +KSYNC generate signal through PWM0 or PWM1
5	19/02/2009	Modify KTEMPMON, KGSMAD. KSIMDET
5	20/02/2009	APPENDIX 13. QA FOR ADVANCED AT COMMAND： +++ for FTP
5	24/02/2009	Delete 10.11 CGSMS duplicated with 10.10
5	25/02/2009	Change +KTEMPMON
5	25/02/2009	CFUN <fun> from 1-4
5	27/02/2009	Add TA for +KCELL
5	27/02/2009	Add some note for KGPIO and KPWM
5	27/02/2009	Change response description after DTR off for +KFTPRCV and +KFTPSND
5	06/03/2009	Add +CSNS command
5	10/03/2009	Modify the cid range for +CGPADDR
6	04/04/2009	IPR: Del unsupported baud rate; SIMDET: note for GPIO CLIP:/CHUP CSMP: add example
7	21/04/2009	Add +KBND command
7	23/04/2009	Add +KTCPSTART Add KTCPSTAT Add +KURCCFG Add example in Appendix: A6.3, A6.4 and A6.5
7	24/04/2009	Change TCP example : value 16 replace by 18 Add information about TA in KCELL

Version	Date	Updates
7	04/05/2009	Update example of +CPMS
7	18/05/2009	Update +VIP
7	20/05/2009	Add AT+KATH Document Release
7	21/05/2009	Update <session id> and add new Err code for TCP/UDP Update +KTCPSTART
7	21/05/2009	Add new error code for SMTP and POP3
7	26/05/2009	Update ATI
7	26/05/2009	Modify SIMDET->SIMCD in KSIMDET
7	29/05/2009	Add AT commands for Audio
7	03/06/2009	Add network scan commands: +KNETSCAN and +KCELLSCAN
7	04/06/2009	Update KCGPADDR; Update Appendix 5: Set of commands supported
7	05/06/2009	Add comments for gpio usage.
7	05/06/2009	Add comments for KSYNC
7	09/06/2009	Add and modify notes for +KNETSCAN and +KCELLSCAN
7	17/06/2009	Correction
7	18/06/2009	Update KCGPADDR and KCNXPROFILE
7	24/06/2009	Update of the template and minor modifications Document Release
7	25/06/2009	Update +CNMI
7	01/07/2009	Update +KSIMDET
7	03/072009	Add read command for KFILTER
7	03/072009	Modify syntax for *PSSTK ="GET INPUT") Delete extended error code for unknown err Delete table for behavior of +++/dtr/ato
7	21/072009	Update CME ERR 100
7	29/07/2009	Add new optional parameter for AT+KTCPCFG, with source port Document Release
7	25/08/2009	Add <mngt> 2 for AT+KSLEEP
7	27/08/2009	In CPWC command change Band order.
7	31/08/2009	Change +CHUP note: hang up waiting/active MT calls and MO calls.
7	03/09/2009	In CPWC command change Band order. Document Release
7	07/09/2009	Add AT*PSSTKI=2 and AT*PSSTKI=3
7	07/09/2009	Correct VIP command
7	10/09/2009	Add +KJAMDET
7	22/09/2009	Add <rssi_threshold> for +KJAMDET

Version	Date	Updates
7	15/10/2009	Explanation of a delay after 0x00 for KSLEEP command
8	28/10/2009	Update the comment of command +KSYNC;+KGSMAD;+KTEMPMON;+KSIMDET;+KFSFILE Document Release
8	17/11/2009	Update +KFILTER
8	04/12/2009	Update AT+CALA
8	09/12/2009	Add HTTP command set
8	22/12/2009	Update +KFTPDCFG
8	28/12/2009	Add +KUART
8	05/01/2010	Update CME ERROR codes
8	14/01/2010	Explanation of CIND value 5
8	29/03/2010	Add +KPLAYSOUND
8	30/03/2010	Add example for CSMP
8	31/03/2010	Update +KPLAYSOUND
8	01/04/2010	Update +KPLAYSOUND
8	02/04/2010	Update +KPLAYSOUND
8	21/04/2010	Update +KFSFILE, for its maxim quota.
8	21/04/2010	Update the note of +KTCPCNX, +KUDPCFG
8	21/04/2010	Add +KEFA
8	04/05/2010	Update KTCPCLOSE
8	04/05/2010	Update *PSCSSC?
8	06/05/2010	Update +KFTPDRUN
9	31/05/2010	Update +CMUX N1 parameter: 1540 is the maximum size. Document release
9	03/06/2010	Update +KTCP_SRVREQ
9	03/06/2010	Add CME code
9	10/06/2010	Update +KFTPSND
9	07/09/2010	Update GPIO and PWM information.
9	26/09/2010	Add 11 new AT command for Hilo V2 Update TCP/UDP examples in A.6 Update AT list in A.5
9	28/09/2010	Correct some errors in contents Update *PSNTRG, *PSCIPH, KTCPCLOSE Update Appendix 5
9	29/09/2010	Update Appendix 5
9	15/10/2010	Update for “ME” of CPBS， not support for phonebook
9	15/10/2010	Update A5:120 seconds for KTCPCLOSE and KUDPCLOSE
9	23/11/2011	Update +KEFA command reply for software without FOTA.
9	23/11/2010	Update +CMGL
9	08/12/2010	Update for FAX not supported in Hilo V2
9	21/12/2010	Update AT+KCNXTIMER
9	30/12/2010	Update AT+KFSFILE
10	07/01/2010	Add Appendix 16 Document release
10.1	09/03/2011	Update AT+KCNXPROFILE?

Version	Date	Updates
10.2	15/03/2011	Update AT+KEFA and Appendix 5
10.3	28/03/2011	- Remove VIP=2/23 for Hilo V1, - Update GPIO: related cmd:KTEMPMON,KSIMDET,KSYNC,KJAMDET,KGPIO,KGPIOCFG - Update +COPS, remove <ACT> - Update +KEFA example - Update some small letter
10.4	11/04/2011	Update title of IPR Update PSMEMCAP
10.5	06/05/2011	Update *PSGCNT Update PSNTRG? Update AT+KEFA
10.6	20/05/2011	Update AT+KSIMDET
10.7	23/05/2011	Update AT+KHTTPGET
10.8	24/05/2011	Add AT+KDSPTX Add AT+KDSPRX
10.9	01/06/2011	Add AT+KBCAP
10.10	10/06/2011	Update AT+KSIMDET Update AT+KGPIOCFG
10.11	14/06/2011	Update <cid> for CGACT Update parameters for VTD, ATO,CAOC, CALM, KUDPCFG, &V,KRIC
10.12	17/06/2011	Add note for VTD
10.13	29/06/2011	Change SAGEM to SAGEMCOM
11	30/06/2011	Add note for *PSRDBS (GSM900 / EGSM) Document release
11.01	11/07/2011	Add +KRST (Periodically reset command) Update “it’s” with “it is”
11.02	14/07/2011	Update +KHTTPGET Add +KPLAYAMR Update appendix 5 for KJAMDET
11.03	22/07/2011	Add err code 4 for KMMRET Add notes for KRST
11.04	26/07/2011	Modify timing for AT*PSCPOF from 30 to 5s and some colors for timing in Appendix array
11.05	27/07/2011	Add +KPCMCFG
11.06	29/07/2011	Update +KGPIOCFG
11.07	02/08/2011	Add info “HiLo V2 ONLY” for +KRST, +KPLAYAMR, +KPCMCFG. Update **0** accordingly
11.08	16/08/2011	Add default GPIO for KJAMDET Update CIND SIMCARD support
11.09	26/08/2011	Update KPSR KPSW for ATO not supported
11.10	20/09/2011	Update KGPIOCFG KGPIO
11.11	21/09/2011	Add DTR behavioural matrix(Appendix 17)
11.12	26/09/2011	Update DTR behavioural matrix(Appendix 17) Update appendix 5 for AT set
11.13	27/10/2011	Update +KSIMDET, +KSYNC, +KTEMPMON, +GSMAD
11.14	01/11/2011	Restore mode 2 of AT+VIP for Hilo V1

Version	Date	Updates
11.15	16/11/2011	Update +KSIMDET, +KGPIOCFG
11.16	22/11/2011	Update +KPLAYAMR
12.00	28/11/2011	Document Release
12.01	30/11/2011	Update +KSIMDET
12.02	14/12/2011	Update +KPLAYAMR
12.03	22/12/2011	Update +KBCAP
12.04	17/01/2012	Add LTO for +KBCAP
12.05	20/01/2012	- Add ADC1 input in +KADC - Volume levels modification in +PCMCFG
12.06	08/02/2012	- Add output PWM1 in +KPWM (for HiLo V1 only)
12.07	08/02/2012	- Modify +CSMS: add service 1 for HiLo V2
12.08	15/02/2012	Syntax error in AT+CMGL[=<stat>]
12.09	20/02/2012	Add KSIMSEL
12.10	13/03/2012	Add append mode for KFSFILE
12.11	14/03/2012	Add note for AT+KSIMSEL=2
12.12	15/03/2012	Add GPIO 1..6 for HiAllNC
12.13	19/03/2011	Add mode 3 and 4 for AT+VIP
12.14	19/03/2012	Change N1 range in CMUX command and Appendix 4
13.00	21/03/2012	Merge ECALL and GNSS AT specification with 2G AT specification Document release
13.01	26/03/2012	Change T1 range in CMUX
13.02	21/03/2012	Review numerotation
13.03	29/03/2012	Come back to N1 initial max value (1540) in CMUX
13.04	30/03/2012	Add 3GPP Reference document for ECALL Remove Pull mode in KECALL command Minor format modifications for ECALL AT commands
13.05	04/04/2012	Add note for KGNSSRST
13.06	04/04/2012	Add note for KGNSSHIST
13.07	05/04/2012	Add note about Pull UP GPIO config for KSIMDET
13.08	06/04/2012	Add note for software flow control (&K) Add note for +++ characters Add 2nd parameter in examples of KNMEARCV
13.09	09/04/2012	Remove “Total number of parameters is limited to 9” from +VTS. Add timezone note for +CCLK
13.10	18/04/2012	Add one configuration for simulator mode (KGNSSRUN)
13.11	18/04/2012	Add one field for simulator mode (KGNSSRST)
13.12	19/04/2012	Update URC KUDP_RCV with KUDPRCV
13.13	23/04/2012	Add notes for CMUX N1 parameter
13.13	24/04/2012	Add note for AT+KGNSSFIX=2,1
14	24/04/2012	Update APPENDIX 3. SET OF COMMANDS SUPPORTED for Hilo3G and HiloNC3GPS
14.01	28/04/2012	Add note for *PSPRAS
14.02	03/05/2012	Add a new chapter: Audio settings during ECALL
14.03	03/05/2012	Describe KSYNC for HiloNC3GPS
14.04	08/05/2012	Update CMUX <N1> Payload size

Version	Date	Updates
14.05	09/05/2012	Underline default value for *PSCSCN, *PSFSNT, *PSSSURC…
14.05	09/05/2012	Update example for KGNSSRST
14.06	10/05/2012	Add comment for +KUARTCFG
14.06	03/05/2012	Add description for Hilo3G Data only +GMR, ATI Add the command +KNETREJSTAT for HiloNC3GPS
14.08	15/05/2012	Update default value for ATV,AT&C,ATX,&R,ATH
14.09	16/05/2012	Add description for HiloV2 only for AT commands relative of ECALL
14.10	22/05/2012	Specify lower and upper limit of maximum size allowed to write NMEA file in File System (AT+KNMEARCV)
14.11	22/05/2012	Add supported bit rates for KPLAYAMR
14.12	23/05/2012	Modify example in +KNMEARCV
14.13	24/05/2012	- Update A5 (support without simcard) - Add KPLAYAMR test command - Remove AT+CGDATA - Add <fcn> for +KGNSSFACT - Add "HiloV2 HiAll only" for PSOPNM,*PSSMPH, etc. - Update KRST
14.14	24/05/2012	Modify example in +KGNSSFACT
14.15	24/05/2012	Root of gps files is /gps
14.16	28/05/2012	Update +KFILTER for<num>[]
14.17	31/05/2012	Change software names gmr and ati for Hilo3G Data only
14.18	05/06/2012	- Modify +KBCAP to add bitmap value in Hexa in read command - Add KBCAP example for 2G modules
14.19	11/06/2012	- Modify clock value for +KPCMCFG
14.20	13/06/2012	-Remove <format>1 for +COPS
14.21	14/06/2012	-<format>1 for +COPS is 3G only
14.22	27/06/2012	Modify example in KFSFILE and KPLAYSOUND (one space to remove before ")
14.23	09/07/2012	Change +KUARTCFG default mode to 2
14.24	10/07/2012	Add a note for KPLAYAMR started during a voice call
14.25	11/07/2012	Modify KUARTCFG modes to have traces available on SPI only
14.26	12/07/2012	Modify KECALLCFG, KECALL, KAECALL and KGNSSHIST information regarding the GNSS position in the MSD
14.27	13/07/2012	Modify KGNSSFIX notes for mode 2 – Bug 3522
14.28	18/07/2012	- Modify description of KECALL command -risk of missing notification bug4251 - Add a note for KGNSSFIX=2,1 bug3522– Bug 3522
14.29	19/07/2012	Add CTZU cmd (bug3482)
14.30	19/07/2012	- Modify KPLAYAMR note for competitive access with KPLAYSOUND bug3522– Bug 3522
14.31	20/07/2012	Add +CTZR cmd (bug4292)
14.32	24/07/2012	Modify KGSN: add type 3 to Serial Number (bug 3970)
14.33	25/07/2012	Modify KGNSSHIST structure meaning
14.34	08/08/2012	Modify KGNSSLTOACT Add <urc>
14.35	09/08/2012	Modify KSIMSEL: add sim used for mode 2 (bug 4279)(bug 3970)
14.36	09/08/2012	Remove "HiloV2 HiAll only" in title for +KPWM
14.37	23/08/2012	Add information about VIP during ECALL in AT+VIP and in §**16.2**

Version	Date	Updates
14.38	28/08/2012	Update KNMEARCV (bug3341) Update KTEMPMON (bug2898)
14.39	29/08/2012	Modify AT&W value parameter for Stored Profile 1 Add information about audio limitation during Ecall in §**16.2**(bug2898)
15	29/08/2012	Document release
15.01	04/09/2012	Add comment in KGNSSFACT about restriction if job in progress (bug 4045)+ modify example (bug 4086)
15.02	07/09/2012	AT+KGNSSRST=4,0. Stop a repeat or continuous GNSSRST.
15.03	12/09/2012	Add AT*VOLWEAR in Hidden mode
15.04	12/09/2012	Add note for AT+CLCK in case of unlock ME then re-lock again Add comment in ECALL chapter in case of 2nd ecall when 1st one not ended yet
15.05	13/09/2012	AT+KNMEARCV=? Add comment. Bug 3337
15.06	13/09/2012	AT+KCNXTIMER write command parameter description. The parameter description list order now matches the order of the command for better understanding.
15.07	19/09/2012	Modify Appendix SET OF COMMANDS SUPPORTED: - “time-out” value increased for AT+KECALL and AT+KAECALL - “With/without SIM” flag added for eCall and GNSS AT commands
15.08	21/09/2012	Add 18.20 Appendix 20: Cause select values for AT*
15.09	27/09/2012	Modify default value for CSTA to have code source consistent value
15.10	28/09/2012	Update KECALLCFG: add Optional Additional Data (bug 4863)
15.11	29/09/2012	Update KCNXTIMER param description
15.12	02/10/2012	Update KGNSSRUN: PPS not supported on HiloNC3GPS
15.13	21/09/2012	Update KGNSSRUN comments in case of new GNSS start when GNSS already started
15.14	04/10/2012	Add New GNSS fields definition
15.15	09/10/2012	Add KGSMBOOT command
15.16	17/10/2012	Remove optional [<cnx nf>] for KUDPCFG
15.17	17/10/2012	GNSSRUN : Add example KGNSSRUN and set boot mode
15.18	19/10/2012	KECALLCFG: modify example for Additional Data
15.19	19/10/2012	Update KECALL command (bug 3226)
15.20	19/10/2012	Update KECALLCFG command (bug 4944)(bug 3226)
15.21	14/11/2012	Add optional features to KTCPCFG, KUDPCFG, KFTPRCV (Resume transfer) and add KTCP_ACK command
15.22	15/11/2012	Modifications in **0** for the new AT commands + modify title name of GNSS and ECALL commands in this document
15.23	16/11/2012	Modifications in **0** for the new AT command KGSMBOOT + minor modifications in KGNSSRUN, KGNSSFIX and in **0**
15.24	28/11/2012	Update KADC for the mea result in µV
16	28/11/2012	Edition 16 issued to go with HiAllNC 001.00 release All history switched to hidden.
16.01	21/12/2012	Add some notes for AT+IPR Add some notes for AT+KGSMBOOT
17.0	February 28, 2013	Added new first line to Patents section of the boilerplate. Replaced all “SAGEMCOM” appearances with “Sierra Wireless”. Sierra Wireless format.

Version	Date	Updates

18.0	April 1, 2013	Added:
		• HTTPS Client Specific Commands:
		  • +KHTTPSCFG: HTTPS Connection Configuration
		  • +KHTTPSHEADER: Set the header of the request
		  • +KHTTPSGET: Get information from HTTP server
		  • +KHTTPSHEAD: Get the head of the information from HTTP server
		  • +KHTTPSPOST: Send data to HTTP server
		  • +KHTTPSCLOSE: Close a HTTPS connection
		• SSL Certificate Manager
		  • +KCERTSTORE: Store root CA and local certificates to file system
		  • +KPRIVKSTORE: Store private key associated to a local certificate
		  • +KCERTDELETE: Delete local certificate from the index
		
		Updated:
		• S0 Command: Notes updated to address ATS0 limitation
		• +KRST Command: Notes
		• +KGSMBOOT Command: Applicable HiLo modules
		• +KCNXCFG through +KCGPADDR, +KFTPCFG, +KFTPDCFG, +KUDPCFG, +KHTTPCFG, and +KGNSSLTOCFG: <cnx cnf> Parameter definition
		• +KFTPRCV: <local_uri> Parameter definition and Notes
		• +KFTPSND: Notes
		• +KGNSSFIX: Description, Write Command Response, Notes, and Example, to update positions management for <mode> 2.
		• +KGNSSHIST: Examples and GNSS Position structure and values
		• +KGNSSFACT: Interval and duration Parameter range values
		• Receive a Voice Call section: Description updated
		• Appendix 5: Supported commands for HiLo modules: Updated table to reflect added commands listed above.

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1. Introduction

1.1. Scope of this Document

This document presents the AT Command Set for the Sierra Wireless HiLo 2G and 3G modules.

Each AT command is described and when necessary, the standard reference is noted (e.g.: 27.007] §7.5).

Some AT command are Sierra Wireless proprietary: in this case it is clearly indicated.

Please refer to section Appendix 5 for the extensive list.

1.2. Reference Documents

[04.08]	GSM 04.08 (6.7.1) – Mobile radio interface layer 3 specification (Release 1997)
[22.022]	3GPP 22.022 (3.1.0) - Personalization of Mobile Equipment (ME); Mobile functionality specification (Release 1999)
[27.005]	3GPP 27.005 (5.0.0) – Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)
[27.007]	3GPP 27.007 (6.0.0) - AT command set for User Equipment (UE) (Release 6)
[V25ter]	ITU-T Recommendation V.25 ter - Serial asynchronous automatic dialing and control
[SIM]	Specification of the Subscriber Identity Module – Mobile Equipment (SIM – ME) interface. (GSM 11.11 version 8.3.0 Release 1999)
[21.905]	3GPP 21.905 (9.4.0) Vocabulary for 3GPP Specifications (Release 9)
[26.267]	3GPP 26.267 (10.0.0) - eCall Data Transfer - In-band modem solution

1.3. Reference Configuration

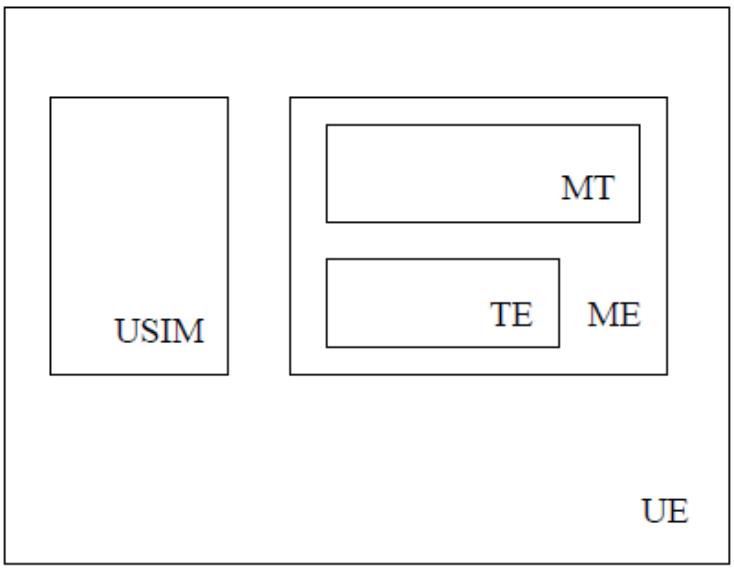


Figure 1. Reference Configuration

The User Equipment (UE) consists of the mobile equipment (ME) and the (U)SIM. Messages may be stored in either, but the present document does not distinguish between messages stored in the (U)SIM or in the ME. The management of message storage in the two parts of the UE is a matter for the UE implementation.

1.4. AT Command Principles

The "*AT*" or "*at*" prefix must be set at the beginning of each line. To terminate a command line, a <*CR*> character must be inserted.

Commands are usually followed by a response that includes *'<CR><LF><response><CR><LF>'.* Throughout this document, only the responses are indicated, the <CR> and <LF> characters are omitted intentionally.

Four kinds of extended AT commands are implemented:

Command Type	Syntax	Definition
Test Command	AT+CXXX=?	The equipment returns the list of parameters and values ranges set with the corresponding Write command or by internal processes
Read Command	AT+CXXX?	This command returns the currently set value of parameters
Write Command	AT+CXXX=<…>	This command sets user-related parameter values
Execution command	AT+CXXX	The execution command reads non-variable parameters affected by internal processes in the equipment

1.4.1. Parameters

In this document, the default parameters are underlined and the optional parameters are enclosed in square brackets.

Optional parameters or sub-parameters can be omitted unless they are followed by other parameters. A parameter in the middle of a string can be omitted by replacing it with a comma.

When the parameter is a character string, the string must be enclosed in quotation marks.

All space characters will be ignored when using strings without quotation marks.

1.4.2. Answers and responses

There is always an answer sent by the TA to an AT Command line (except the very special case of a TA setup for no answer, see ATQ).

The answer is always terminated by an indication of success or failure. However, regarding the setup of the TA (by AT Commands), the message may be different.

Classical messages:	**OK or ERROR**
Extended Error message (see AT+CMEE):	**+CME ERROR: <n>**
	(See Appendix for the different values for **<n>**)
Numeric Mode (see ATV) :	**<n>** with: <**n**> = 0 ⇔ OK or **<n>** is an error code

1.4.3. Multiple AT commands on the same command line

You may enter several AT commands on the same line. This eliminates the need to type the "AT" or "at" prefix before each command and to wait for the answer for each command. The main advantage is to avoid losing bandwidth on the link between DTE and the Module.

There is no separator between two basic commands but a semi-colon character is necessary between two extended commands (prefix +).The command line buffer accepts a maximum of 391 characters. If this number is exceeded none of the commands will be executed and TA returns ERROR.

If a command is not supported, then the treatment of the line is stopped (i.e. the following ones are not treated) and an error message is returned.

Example:

Command: ATZ&K3+CBST=7,0,1**;**+CBST?

Answer: +CBST=7,0,1

OK

1.4.4. AT Commands on separate lines

When you enter a series of AT commands on *separate* lines, it is strongly advised to leave a pause between the preceding and the following command until the final answer (OK or Error message) appears. This avoids sending too many AT commands at a time without waiting for a response for each.

1.5. USB Virtual Ports Restriction

For HiLo 3G family

3 virtual com ports are supported:

1. Simple AT command port
2. Advanced AT command (called "Modem") port
3. Diagnostic port (used for Traces)

On the simple AT command port CSD/GPRS data commands are not supported (e.g. +++, ATO, ATD*99… are not supported).

For HiLo 3GPS family

3 virtual com ports are supported:

1. NMEA port (used by the GNSS)
2. Advanced AT command (called “Modem”) port
3. Diagnostic port (used for Traces)

Note:	*UART port can support all commands listed in this spec and it also supports CS data calls and GPRS calls.*

1.6. Unsolicited Result Codes (URCs)

Unsolicited result codes (URCs) are sent simultaneously to all the channels (USB/UART) configured in AT commands mode (see +KUARTCFG to know how to configure USB and UART in AT commands mode).

URCs are not sent to channels configured in Data/NMEA/Traces modes.

In sleep mode URCs wake up the module and are sent to the AT commands channels.

1.7. Document Modification

The commands described in this document are only to be used for usual AT commands use.

The information provided for the commands are subject to change without notice..

1.8. Abbreviations

Abbreviation	Definition
ACM	Accumulated Call Meter
ADC	Analog Digital Converter
ADN	Abbreviated Dialing Number (Phonebook)
AMR	Adaptive Multi-Rate
AMR-FR	AMR Full Rate (full rate speech version 3)
AMR-HR	AMR Half Rate (half rate speech version 3)
AOC	Advice Of Charge
APN	Access Point Name
ARN	Address Resolution Protocol
ARFCN	Absolute Radio Frequency Channel Number
ASCII	American Standard Code for Information Interchange, Standard characters table (1 byte coding)
AT	ATtention; Hayes Standard AT command Set
BCCH	Broadcast Channel
BER	Bit Err Rate
BM	Broadcast Message Storage
CBM	Cell Broadcast Message
CB	Cell Broadcast
CCK	Corporate Control Key
CCM	Current Call Meter
CHV	Card Holder Verification
CHAP	Challenge handshake Authentication Protocol
CI	Cell Identifier
CLI	Client Line Identification
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CNL	Cooperative Network List
CODEC	Coder Decoder

Abbreviation	Definition
COLP	Connected Line Identification Presentation
CPHS	Common PCN Handset Specification
CPU	Central Processing Unit
CSD	Circuit Switched Data
CSP	Customer Service Profile
CTM	Cellular Text telephone Modem
CTS	Clear To Send signal
CUG	Closed User Group
DAC	Digital to Analog Converter
DTR	Data Terminal Ready
DCS	Digital Cellular System
DCE	Data Circuit Equipment
DCD	Data Carrier Detect
DLC	Data Link Connection
DLCI	Data Link Connection Identifier
DM	Device Management
DNS	Domain Name System
DSR	Data Set Ready
DTE	Date Terminal Equipment
DTMF	Dual Tone Multi-Frequency
DTR	Data Terminal Ready
ECC	Emergency Call Codes
ECM	Error Correction Mode
ECT	Explicit Call Transfer
EDGE	Enhanced Data rates for GSM Evolution
EEPROM	Electrically Erasable Programming Only Memory
EF	Elementary Files
EFR	Enhanced Full Rate (full rate speech version 2)
EGPRS	Enhanced GPRS
ENS	Enhanced Network Selection
E-ONS	Enhanced Operator Name Service
ERMES	European Radio Messaging System
ETSI	European Telecommunications Standards Institute
FD	FIFO depth
FDN	Fixed Dialing Number (Phonebook)
FR	Full Rate (full rate speech version 1)
GERAN	GSM EDGE Radio Access Network
GPIO	General Purpose Input Output
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
HDLC	High-level Data Link Control
HFR	High Frequency Regeneration
HLR	Home Location Register

Abbreviation	Definition
HR	Half Rate (half rate speech version 1)
ID	IDentifier
IETF	Internet Engineering Task Force
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IN/OUT/IN_OUT	In, out or In Out. see glossary
I/O	Input/Output
IP	Internet Protocol
LAC	Local Area Code
LED	Light Emitting Diode
LND	Last Number Dialed
LP	Language Preferred
LPI	Lines Per Inch
M	Mandatory
MCC	Mobile Country Code
ME	Mobile Equipment
MMI	Man Machine Interface
MNC	Mobile Network Code
MNP	Microcom Networking Protocol
MO	Mobile Originated
MOC	Mobile Originated Call (outgoing call)
MS	Mobile Station
MSB	Most Significant Bit
MSISDN	Mobile Station International ISDN Number
MT	Mobile Terminal
MTC	Mobile Terminated Call (incoming call)
N.A.	Not applicable
NCK	Network Control Key
NITZ	Network Information and Time Zone
NSCK	Network Subset Control Key
NTC	Negative Temperature Coefficient
N.U.	Not used
O	Optional
OA	Outgoing Access
OPL	Operator PLMN List
OS	Operating System
OTA	Over the Air
PAD	Portable Application Description
PAP	Password Authentication Protocol
PC	Personal Computer
PCCP	PC character set Code Page
PCK	Personalization Control Key
PCL	Power Control Level

Abbreviation	Definition
PCM	Protection Circuit Module
PCN	Personal Communication Network
PCS 1900	Personal Communication Service (GSM system offering 148 full duplex voice channels per cell)
PDP	Packet Data Protocol
PDU	Protocol Description Unit
PIN	Personal Identification Number
PLMN	Public Land Mobile Networks
PNN	PLMN Network Name
PPP	Point-to-Point Protocol Peer to Peer
PSTN	Public Switched Telephone Network
PTS	Product Technical Specification
PUCT	Price per Unit and Currency Table
PUK	PIN Unlock Key
PWM	Pulse Width Modulation
QoS	Quality of Service
RAM	Random Access Memory
RDMS	Remote Device Management Services
RI	Ring Indicator
RIL	Radio Interface Layer
RLP	Radio Link Protocol
RSSI	Received Signal Strength Indication
RTS	Ready To Send signal
RX	Reception
SAP	Service Access Point
SC	Service Center
SDU	Service Data Unit
SIM	Subscriber Information Module
SMSR	Short Message Status Report
SMS	Short Message Service
SS	Supplementary Services
SPCK	Service Provider Control Key
SPN	Service Provider Name
STK	SIM ToolKit
SVN	Software Version Number
TA	Terminal Adaptor
TBF	Temporary Block Flow
TE	Terminal Equipment
TTY	TeleTYpe
TON/NPI	Type Of Number/Numbering Plan Identification
TX	Transmission
UART	Universal Asynchronous Receiver Transmitter
UCS2	Universal Character Set 2 Character table (2-byte coding)

Abbreviation	Definition
UDUB	User Determined User Busy
UIH	Unnumbered Information with Header check
USB	Universal Serial Bus
USSD	Unstructured Supplementary Service Data

2. V25ter AT Commands

2.1. A/ Command: Repeat Previous Command Line

A/ : Repeat previous command line	
Execute command Syntax **A/**	 Response Depend on the previous command Parameters None
Reference V.25Ter	Notes • Line does not need to end with terminating character

2.2. +++ Command: Switch from Data Mode to Command Mode

+++ : Switch from data mode to command mode	
Execute command Syntax **+++**	 Response This command is only available during data mode. The +++ character sequence suspends the data flow over the AT interface and switches to command mode. This allows entering AT commands while maintaining the data connection to the remote device. **OK** Parameters None
Reference V.25Ter	Notes • To return to data mode, use the ATO[n] command • Line needs one second silence before and one second after (do not end with terminating character) • The "+" character may be changed with the ATS2 command (see following chapters) • The +++ characters are not transmitted in the data flow

2.3. O Command: Switch from Command Mode to Data Mode

ATO : Switch from command mode to data mode	
Test command Syntax **ATO[<n>]**	Response TA returns to data mode from command mode: **CONNECT <text>** If connection is not successfully resumed **NO CARRIER** Parameter **<n>:** 0: switch from command mode to data mode 1-200: session ID, See “Protocol specific commands (TCP/UDP/FTP…)” **HiLo3G** and **HiLoNC3GPS** only support 1 session so only ATO
Reference V.25Ter	Notes • ATO is the alternative command to the +++ escape sequence described in Chapter 2.2: When you have established a data call and TA is in command mode, ATO causes the TA to resume the data connection and return to data mode

2.4. E Command: Enable Echo Command

ATE : Enable command echo	
Execute command Syntax **ATE[<value>]**	Response **OK** Parameters **<value>:** 0: Echo mode off 1: Echo mode on
Reference V.25Ter	Notes • This setting determines whether or not the TA echoes characters received from TE during the command state

2.5. Q Command: Set Result Code Presentation Mode

ATQ : Set result code presentation mode	
Execute command Syntax **ATQ[<n>]**	 Response **OK** (if **<n>** = 0) *Nothing* (if **<n>** = 1) Parameters **<n>:** 0: result codes transmitted by TA 1: no result codes transmitted by TA
Reference V.25Ter	Notes • Specifies whether or not the TA transmits any result code to the TE. Information text transmitted in response is not affected by this setting

2.6. S0 Command: Set Number of Rings before Automatic Call Answering

ATS0 : Set number of rings before automatically answering the call	
Read command Syntax **ATS0?**	 Response **<n>** **OK**
Write command Syntax **ATS0=<n>**	 Response **OK** Parameters **<n>:** 0: automatic answering deactivated 1-255: number of rings before automatically answering
Reference V.25ter	Notes • See Data stored by &W for default value • For HiALL and HiloV2: In data mode (after any CONNECT) automatic call answering does not work that means that incoming calls are not automatically answered during data mode.

2.7. S2 Command: Set Character for the Escape Sequence (Data to Command Mode)

ATS2 : Set character for the escape sequence (data to command mode)	
Read command Syntax **ATS2?**	 Response **<n>** **OK**
Write command Syntax **ATS2=<n>**	 Response **OK** Parameters **<n>:** only 43 ("+") is supported
Reference V.25ter	Notes • The default character is "+" (043) and cannot be changed

2.8. S3 Command: Command Line Termination Character

ATS3 : Command line termination character	
Read command Syntax **ATS3?**	 Response **<n>** **OK**
Write command Syntax **ATS3=<n>**	 Response **OK** Parameters **<n>:** 13: command line termination character<CR>: carriage return
Reference V.25Ter	Notes • This parameter determines the character recognized by TA to terminate an incoming command line (13 = <CR> by default); it cannot be changed • See Data stored by &W for default value

2.9. S4 Command: Set Response Formatting Character

ATS4 : Set response formatting character	
Read command Syntax **ATS4?**	 Response **<n>** **OK**
Write command Syntax **ATS4=<n>**	 Response **OK** Parameters **<n>:** 10: response formatting character <LF>: line feed
Reference V.25Ter	Notes • This parameter determines the character recognized by TA to terminate answer line (10 = <LF> by default); it cannot be changed • See Data stored by &W for default value

2.10. S5 Command: Write Command Line Editing Character

ATS5 : Write command line editing character	
Read command Syntax **ATS5?**	 Response **<n>** **OK**
Write command Syntax **ATS5=<n>**	 Response **OK** Parameters **<n>:** 1..255: number of second to wait for connection completion
Reference V.25Ter	Notes • This parameter determines the character recognized by TA to terminate an incoming command line (8 = <backspace> by default); it cannot be changed • See Data stored by &W for default value

ATS5 : Write command line editing character	HiLo3G HiLoNC3GPS
Read command Syntax **ATS5?**	 Response **<n>** **OK**
Write command Syntax **ATS5=<n>**	 Response **OK** Parameters **<n>:** 8: command line editing character<BS>: back space
Reference V.25Ter	Notes • This parameter determines the character recognized by TA to terminate an incoming command line (8 = <backspace> by default); it cannot be changed • See Data stored by &W for default value

2.11. S7 Command: Set Delay for Connection Completion

ATS7 : Set number of seconds to wait for connection completion	
Read command Syntax **ATS7?**	 Response **<n>** **OK**
Write command Syntax **ATS7=<n>**	 Response **OK** Parameters **<n>:** 1...255: number of second to wait for connection completion
Reference V.25Ter	Notes • See also AT&V for default values of this parameter • See Data stored by &W for default value

2.12. V Command: TA Response Format

ATV : Set TA response format	
Execute command Syntax **ATV[<value>]**	 Response **0** (When numeric mode activated) **OK** (When verbose mode activated) Parameters **<value>:** 0: Short result code format: **<numeric code>** 1: Long result code format: **<verbose code>**
Reference V.25Ter	Notes • Data stored by &W for default value

2.13. X Command: Result Code Selection and Call Progress Monitoring Control

ATX : Result code selection and call progress monitoring control	
Write command Syntax **ATX[<value>]**	 Response **OK** Parameters **<value>:** 0 : CONNECT result code only returned, dial tone and busy detection are both disabled 1 : CONNECT<text> result code only returned, dial tone and busy detection are both disabled 2 : CONNECT<text> result code returned, dial tone detection is enabled, busy detection is disabled 3 : CONNECT<text> result code returned, dial tone detection is disabled, busy detection is enabled 4 : CONNECT<text> result code returned, dial tone and busy detection are both enabled
Reference V.25Ter	Notes • See Data stored by &W for default value

ATX : Result code selection and call progress monitoring control	HiLo3G HiLoNC3GPS
Write command Syntax **ATX[<value>]**	 Response **OK** Parameters **<value>:** 0 : CONNECT result code only returned 1 : CONNECT<text> result code only returned 2 : CONNECT<text> result code only returned 3 : CONNECT<text> result code only returned 4 : CONNECT<text> result code only returned
Reference V.25Ter	Notes • See Data stored by &W for default value • Modes 1,2,3,4 do the same for compatibility reason

2.14. &C Command: Set Data Carrier Detect (DCD) Function Mode

AT&C : Set circuit Data Carrier Detect (DCD) function mode	
Execute command Syntax **AT&C<value>**	 Response **OK** Parameters **<value>:** 0 : DCD line is always active 1: DCD line is active in the presence of data carrier only
Reference V.25Ter	Notes • Data stored by &W for default value

2.15. &D Command: Set Data Terminal Ready (DTR) Function Mode

AT&D : Set circuit Data Terminal Ready (DTR) function mode	
Execute command Syntax **AT&D<value>**	Response **OK** Parameters **<value>:** 0: TA ignores status on DTR 1: DTR drop from active to inactive: Change to command mode while retaining the connected data call 2: DTR drop from active to inactive: Disconnect data call, change to command mode. During state DTR inactive auto-answer is off
Reference V.25Ter	Notes • The command AT&D only applies to data calls. Thus, a DTR drop from active to inactive in AT&D2 mode will not hang up a voice call • See also the appendix about the DTR +++ ATO behaviors matrix

2.16. &F Command: Restore Factory Settings

AT&F : Restore factory settings	
Execute command Syntax **AT&F[<value>]**	Response **OK** Parameters **<value>:** 0: Restore parameters to factory settings
Reference V.25Ter	Notes • See also AT&V • Restore factory settings to active profile

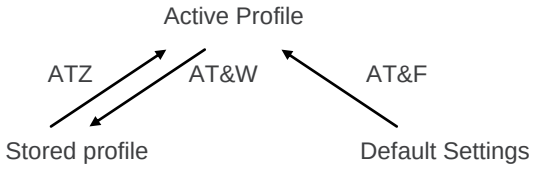
2.17. &W Command: Save Stored Profile

AT&W : Save stored profile	
Execute command Syntax **AT&W[<value>]**	Response **OK** Parameters **<value>:** 0: Save in **STORED PROFILE 0** 1: Save in **STORED PROFILE 1**

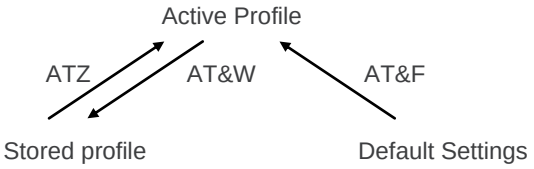
AT&W : Save stored profile	
Reference Sierra Wireless Proprietary	Notes • This command saves the current configuration in a non-erasable place • See also AT&V • The default stored profile may be adapted for customer needs Configuration saved: E: Echo Q: Set result code presentation mode V: Verbose X: Extended result code &C: DCD control &D: DTR behavior &R: RTS control &S0 DSR control &K Flow control FCLASS: FCLASS S0: Set number of rings before automatically answering the call S3: Write command line termination character S4: Set response formatting character S5: Write command line editing character S7: Set number of seconds to wait for connection completion S8: Comma dial modifier time S10: Automatic disconnect delay

AT&W : Save stored profile	**HiLo3G HiLoNC3GPS**
Execute command Syntax **AT&W**	 Response **OK**
Reference Sierra Wireless Proprietary	Notes • This command saves the current configuration in a non-erasable place • See also AT&V • The default stored profile may be adapted for customer needs Configuration saved: E: Echo Q: Set result code presentation mode V: Verbose X: Extended result code &C: DCD control &D: DTR behavior &R: RTS control &S0 DSR control &K Flow control S0: Set number of rings before automatically answering the call S3: Write command line termination character S4: Set response formatting character S5: Write command line editing character S7: Set number of seconds to wait for connection completion S8: Comma dial modifier time S10: Automatic disconnect delay

2.18. &V Command: Display Current Configuration

AT&V : Display current configuration	
Execute command Syntax **AT&V[<value>]**	 Response **ACTIVE PROFILE:** **<current configuration>** **STORED PROFILE 0:** **<user default configuration>** **STORED PROFILE 1:** **<manufactory configuration>** OK Parameters **<value>:** 0: profile number
Reference Sierra Wireless Proprietary	Notes • At startup, Stored profile is copied to the Active profile • The configuration is a text string on multiple lines as shown in the example below. This string may vary depending on the manufactory, the product and the user setup Example E1 Q0 V1 X4 &C1 &D1 &R1 &S0 +IFC= 0,2 &K0 +FCLASS0 S00:0 S03:13 S04:10 S05:8 S07:50 S08:2 S10:14 • This command indicates the result of certain actions as shown below: 

AT&V : Display current configuration	**HiLo3G HiLoNC3GPS**
Execute command Syntax **AT&V[<value>]**	 Response **ACTIVE PROFILE:** **<current configuration>** **STORED PROFILE:** **<user default configuration>** OK Parameters **<value>:** 0:display Active profile 1: display Stored profile Omitted: display all profile (active profile and stored profile)

AT&V : Display current configuration	**HiLo3G HiLoNC3GPS**
Reference Sierra Wireless Proprietary	Notes • At startup, Stored profile is copied to the Active profile • The configuration is a text string on multiple lines as shown in the example below. This string may vary depending on the manufactory, the product and the user setup Example E1 Q0 V1 X4 &C1 &D1 &R1 &S0 +IFC= 0,2 &K0 S00:0 S03:13 S04:10 S05:8 S07:50 S08:2 S10:14 • This command indicates the result of certain actions as shown below: 

2.19. IPR Command: Set Fixed Local Rate

AT+IPR : Set fixed local rate	
Test command Syntax **AT+IPR=?**	 Response **+IPR:** (list of supported auto-detectable **<rate>s**), (list of supported fixed-only **<rate>s**) **OK**
Read command Syntax **AT+IPR?**	 Response **+IPR: <rate>** **OK**
Write command Syntax **AT+IPR=<rate>**	 Response **OK** Parameters **<rate>:** bit rate per second 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 0 =Autobaud

AT+IPR : Set fixed local rate	
Reference V.25ter	Notes • The speed is modified after sending the answer • **With AUTOBAUD only capital letters for AT commands have to be used** • Normalized Baud rate ;Accepted range autobaud ;Accepted range not autobaud 115200 ;[115044.25 ;115555.56] ;[109810 ;120870] 57600 ;[57522.12 ;57649.67] ;[54855 ;60374] 38400 ;[38348.08 ;38404.73] ;[36510 ;40230] 19200 ;[19188.19 ;19202.36] ;[18249 ;20124] 9600 ;[9597.64 ;9601.18] ;[9125 ;10061] 4800 ;[4799.70 ;4800.59] ;[4562 ;5030] 2400 ;[2399.85 ;2400.07] ;[2290 ;2516] 1200 ;[1199.98 ;1200.04] ;[1140 ;1256]

AT+IPR : Set fixed local rate	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+IPR=?**	Response **+IPR:** (list of supported auto-detectable **<rate>s**), (list of supported fixed-only **<rate>s**) **OK**
Read command Syntax **AT+IPR?**	Response **+IPR: <rate>** **OK**

AT+IPR : Set fixed local rate	HiLo3G HiLoNC3GPS
Write command Syntax **AT+IPR=<rate>**	Response **OK** Parameters **<rate>:** bit rate per second 3686400 (4 Mbit/s) , 921600(1 Mbit/s), 460800, 230400, 115200, 57600, 38400, 19200, 9600, 800, 2400, 1200, 600, 300
Reference V.25ter	Notes • The speed is modified after sending the answer

2.20. B: Data Rate Selection

ATB : Data Rate Selection	
Execute Command Syntax **ATB<rate>**	Response **OK** Parameters **<rate>:** number from [0, 99], but meaningless
Reference V.25ter	Notes • The responses of this command are compliant with the recommendation but this command has no effect • It is recommended to use AT+CBST instead of this command

2.21. \N: Data Transmission Mode

AT\N : Data transmission Mode	
Execute Command Syntax **AT\N<x>**	Response **OK** Parameters **<x>:** 0: transparent mode 4, 6: RLP mode (nontransparent)
Reference V.25ter	Notes • Not support. It is recommended to use AT+CBST instead of this command

2.22. &K Command: Flow Control Option

AT&K : Flow control command	
Execute command Syntax **AT&K<mode>**	 Response **OK** Parameters **<mode>:** 0: Disable all flow control 3: Enable bi-directional hardware flow control 4: Enable XON/XOFF flow control
Reference V.25ter	Notes • Use AT&V0 to display the current flow control setting • Sierra Wireless recommends the use of the hardware Flow control • The software flow control is supported if the data to be transmitted are coded in ASCII (in this case XON/XOFF controls and data are differentiated) or the customer manages the data encapsulation and does not include XON XOFF with the data

2.23. L Command: Monitor Speaker Loudness

ATL : Monitor speaker loudness	
Write command Syntax **ATL [<volume>]**	 Response **OK** Parameter **<volume>:** 0..9
Reference ITU-T V.250 § 6.3.13	Notes • The responses of this command are compliant with the recommendation but this command has no effect

2.24. M Command: Monitor Speaker Mode

ATM : Monitor speaker loudness	
Write command Syntax **ATM[<mode>]**	 Response **OK** Parameter **<mode>:** 0..9
Reference ITU-T V.250 § 6.3.14	Notes • The responses of this command are compliant with the recommendation but this command has no effect

2.25. S6 Command: Pause before Blind Dialing

ATS6 : Pause before blind dialing	
Write command Syntax **ATS6=<time>**	 Response **OK** Parameter **<time>:** 0..999
Reference ITU-T V.250 § 6.3.9	Notes • The responses of this command are compliant with the recommendation but this command has no effect

2.26. S8 Command: Comma Dial Modifier Time

ATS8 : Comma usage in dial modifier time	
Read command Syntax **ATS8?**	 Response **<time>** **OK**
Write command Syntax **ATS8=<time>**	 Response **OK** Parameter **<time>:** 0...255. See Data stored by &W for default value
Reference ITU-T V.250 §6.3.11	Notes • Since comma is ignored in D command, this command has no effect

2.27. S10 Command: Automatic Disconnect Delay

AT10 ; Automatic disconnect delay	
Read command Syntax **ATS10?**	 Response **<time>** **OK**
Write command Syntax **ATS10=<time>**	 Response **OK** Parameter **<time>:** 1...254. See Data stored by &W for default value
Reference ITU-T V.250 §6.3.12	Notes • The responses for this command are compliant with the recommendation but this command has no effect

2.28. N Command: Negotiate Handshake Option

ATN : Negotiate handshake option	
Write command Syntax **ATN[<option>]**	 Response **OK** Parameter **<option>:** 0..9
Reference	Notes • The responses for this command are compliant with the recommendation but this command has no effect

2.29. S1 Command: Ring Count

ATS1 : Set ring count	
Read command Syntax **ATS1?**	 Response **<num>** **OK** Parameter **<num>:** 0…255. See Data stored by &W for default value

ATS1 : Set ring count	
Reference	Notes • Read command returns the number <num> of ring occurrences for last incoming data, fax or voice call • Fax is for HiLo V1 only, not supported in HiLo V2, HiLo3G and HiLoNC3GPS

2.30. S11 Command: DTMF Dialing Speed

ATS11 : DTMF Dialing speed	
Write command Syntax **ATS11=<time>**	 Response **OK** Parameter **<time>:** 0..999
Reference	Notes • The responses for this command are compliant with the recommendation but this command has no effect

2.31. W Command: Extended Result Code

ATW : Extended result code	
Write command Syntax **ATW <mode>**	 Response **OK** Parameter **<mode>:** 0 (only result code CONNECT supported)
Reference	Notes • Execution command determine which <mode> of result code is to be used as extended result code in addition to the CONNECT result code

ATW : Extended result code	HiLo3G HiLoNC3GPS
Write command Syntax **ATW <mode>**	 Response **OK** Parameter **<mode>:** 0: only CONNECT 1: CONNECT <text>

ATW : Extended result code	**HiLo3G HiLoNC3GPS**
Reference	Notes • Execution command determine which <mode> of result code is to be used as extended result code in addition to the CONNECT result code

2.32. &S Command: DSR Option

AT&S : Data set ready option	
Write command Syntax **AT&S[<override>]**	 Response **OK** Parameter **<override>:** 0 or omitted : DSR signal always ON (0 is the default value) 1 : DSR signal always OFF (See Data stored by &W for default value)
Reference	Notes

2.33. &R Command: RTS/CTS Option

AT&R : Ready to send/Clear to send option	
Write command Syntax **AT&R <option>**	 Response **OK** Parameter **<option>:** 1=> In sync mode, CTS is always ON (RTS transitions are ignored). In async mode, CTS will only drop if required by the flow control (See Data stored by &W for default value)
Reference	Notes • This selects how the modem controls CTS. CTS operation is modified if hardware flow control is selected (see &K command). The parameter value, if valid, is written to S21 bit2

2.34. &E Command: Data Rate Option for Data Call

AT&E : Data rate option for data call	**HiLo3G HiLoNC3GPS**
Write command Syntax **AT&E<option>**	 Response **OK** Parameter **<option>:** 0: default value. The data rate is the wireless connection speed in data call 1: The data rate should be the serial connection rate if connection port is UART port, but if the connection port is USB port, the data rate is the wireless connection speed
Reference	Notes

3. General AT Commands

3.1. I Command: Request Identification Information

ATI : Request identification information	
Execute command Syntax **ATI[<value>]**	 Response **<text>** (depends on **<value>**) **OK** Parameter **<value>:** 0 or omitted: Model identifier 3: Software version Example: ATI HILO GPRS OK ATI3 Hi2C,A OK
Reference V.25ter	Notes • See also AT+GMR, AT+CGMR

ATI : Request identification information	**HiLo3G HiLoNC3GPS**
Execute command Syntax **ATI[<value>]**	 Response **<text>** (depends on **<value>)** **OK** Parameter **<value>:** 0 or omitted: Model identifier 3: Project identifier

ATI : Request identification information **HiLo3G HiLoNC3GPS**

Reference
V.25ter

Notes
See also AT+GMR, AT+CGMR

Module Type	ATI	ATI3
HiLo3G-850 HiLo3G-900	HiLo3G 850 HiLo3G 900	Hi3GC,A Hi3GC,A
HiLo3G-D850 HiLo3G-D900	HiLo3G 850 HiLo3G 900	Hi3GC,A Hi3GC,A
HiLoNC-3GPS HiLoNC-3GPS US	HiLoNC-3GPS HiLoNC-3GPS US	HiN3GPS,A HiN3GPS,A
HiLoNC-3GPS Enhanced HiLoNC-3GPS US Enhanced	HiLoNC-3GPS E HiLoNC-3GPS US E	HiN3GPSE,A HiN3GPSE,A
HiLoNC-3GPS-D HiLoNC-3GPS-D US	HiLoNC-3GPS-D HiLoNC-3GPS-D US	HiN3GPSD,A HiN3GPSD,A
HiLoNC-3GPS-D Enhanced HiLoNC-3GPS-D US Enhanced	HiLoNC-3GPS-D E HiLoNC-3GPS-D US	HiN3GPSDE,A HiN3GPSDE,A

N: without connector	A: Certification release
3G: 3G capable	xxx.xx: Software version
PS: GNSS capable	
US: 3G US bands only	850: bands 1,2,5
Enhanced: 3G high data speed	900: bands 1,2,8
D: Data only (no voice)	

Example

Type: HiLo3G-850	Type: HiLoNC-3GPS-D Enhanced	Type: HiLoNC-3GPS US
ATI	ATI	ATI3
HiLo3G 850	HiLoNC-3GPS-D E	HiN3GPS,A
OK	OK	OK

3.2. Z Command: Reset and Restore User Configuration

ATZ : Reset and restore user configuration	
Execute command Syntax **ATZ[<value>]**	 Response **OK** Parameter **<value>:** 0: Reset and restore user configuration with profile 0 1: Reset and restore user configuration with profile 1
Reference V.25ter	Notes See also AT&V

3.3. +CGMI Command: Request Manufacturer Identification

AT+CGMI : Request manufacturer identification	
Test command Syntax **AT+CGMI=?**	 Response **OK**
Execute command Syntax **AT+CGMI**	 Response **(manufacturer identification text)** **OK** Example **AT+CGMI** **Sierra Wireless** **OK**
Reference [27.007] § 5.1	Notes

3.4. +CGMM Command: Request Model Identification

AT+CGMM : Request model identification	
Test command Syntax **AT+CGMM=?**	 Response **OK**
Execute command Syntax **AT+CGMM**	 Response **(model identification text)** **OK**
Reference [27.007] § 5.2	Notes

3.5. +CGMR Command: Request Revision Identification

AT+CGMR : Request revision identification	
Test command Syntax **AT+CGMR=?**	 Response **OK**
Execute command Syntax **AT+CGMR**	 Response **(model revision identification text)** **OK**
Reference [27.007] § 5.3	Notes

AT+CGMR : Request revision identification	HiLo3G HiLoNC3GPS
Test command Syntax **AT+CGMR=?**	 Response **OK**
Execute command Syntax **AT+CGMR**	 Response **(model revision identification text)** **OK**

AT+CGMR : Request revision identification **HiLo3G HiLoNC3GPS**

Reference
[27.007] § 5.3

Notes

Module Type	AT+CGMR / AT+GMR
HiLo3G-850 HiLo3G-900	Hi3GC,A.xxx.xx Hi3GC,A.xxx.xx
HiLoNC-3GPS HiLoNC-3GPS US	HiN3GPS,A.xxx.xx HiN3GPS,A.xxx.xx
HiLoNC-3GPS Enhanced HiLoNC-3GPS US Enhanced	HiN3GPSE,A.xxx.xx HiN3GPSE,A.xxx.xx
HiLoNC-3GPS-D HiLoNC-3GPS-D US	HiN3GPSD,A.xxx.xx HiN3GPSD,A.xxx.xx
HiLoNC-3GPS-D Enhanced HiLoNC-3GPS-D US Enhanced	HiN3GPSDE,A.xxx.xx HiN3GPSDE,A.xxx.xx

Module Type	AT+CGMR examples
HiLo3G-850 HiLo3G-900	Hi3GC,A.002.16 Hi3GC,A.002.16
HiLo3G-D850 HiLo3G-D900	Hi3GC,A.002.16 Hi3GC,A.002.16
HiLoNC-3GPS HiLoNC-3GPS US	HiN3GPS,A.002.16 HiN3GPS,A.002.16
HiLoNC-3GPS Enhanced HiLoNC-3GPS US Enhanced	HiN3GPSE,A.002.16 HiN3GPSE,A.002.16
HiLoNC-3GPS-D HiLoNC-3GPS-D US	HiN3GPSD,A.002.16 HiN3GPSD,A.002.16
HiLoNC-3GPS-D Enhanced HiLoNC-3GPS-D US Enhanced	HiN3GPSDE,A.002.16 HiN3GPSDE,A.002.16

3.6. +CGSN Command: Request Product Serial Number Identification (IMEI)

AT+CGSN : Request International Mobile Equipment Identification (IMEI)	
Test command Syntax **AT+CGSN=?**	 Response **OK**
Execute command Syntax **AT+CGSN**	 Response **<sn>** (identification text for determination of the individual ME) **OK**
Reference [27.007] § 5.4	Notes

3.7. +KGSN Command: Request Product Serial Number and Software Version

AT+KGSN : Request International Mobile Equipment Identification (IMEI) and Software Version	
Test command Syntax **AT+KGSN=?**	 Response **+KGSN:** (list of supported **<number type>**s) **OK**
Execute command Syntax **AT+KGSN=<number type>**	 Response If **<number type>** = 0: +KGSN: **<IMEI>** **OK** If **<number type>** = 1: +KGSN: **<IMEISV>** **OK** If **<number type>** = 2: +KGSN: **<IMEISV_STR>** **OK** If **<number type>** = 3: +KGSN: **<SN>** **OK**

AT+KGSN : Request International Mobile Equipment Identification (IMEI) and Software Version	
Execute command Syntax **AT+KGSN=<number type>**	Parameters **<IMEI>:** 15 digits IMEI (8 digits for TAC + 6 digits for SNR + 1 check digit) **<IMEISV>:** 16 digits IMEISV (8 digits for TAC + 6 digits for SNR + 2 SVN digits) **<IMEISV_STR>:** formatted string : <15 digits>-<Check digit> SV: <Software version> **<SN>:** 10 digits Serial Number
Reference Sierra Wireless proprietary	Notes • This command has been developed to provide the IMEI SV and Serial Number through an AT Command Example AT+KGSN=0 +KGSN: **3515780**0023006 OK AT+KGSN=1 +KGSN: **3515780**0023000**1** OK

3.8. +CSCS Command: Set TE Character Set

AT+CSCS : Set Terminal Equipment character set	
Test command Syntax **AT+CSCS=?**	Response **+CSCS:** (list of supported **<chset>**) **OK**
Read command Syntax **AT+CSCS?**	Response **+CSCS: <chset>** **OK**
Write command Syntax **AT+CSCS=<chset>**	Response **OK** Parameter **<chset>:** **"GSM"** GSM default alphabet (GSM 03.38 sub clause 6.2.1) **"UCS2"** 16 bit universal multiple-octet coded character set (ISO/IEC 10646) **"IRA"** default value
Reference [27.007] §5.5	Notes • Select the character set used for all string types (Phonebook entries, SMS data…)

3.9. +CIMI Command: Request International Subscriber Identity

AT+CIMI : Request international subscriber identity	
Test command Syntax **AT+CIMI=?**	 Response **OK**
Execute command Syntax **AT+CIMI**	 Response **<IMSI>**: (International Mobile Subscriber Identifier) **OK**
Reference [27.007] § 5.6	Notes

3.10. +GCAP Command: Request Complete TA Capability List

AT+GCAP ; Request complete Terminal Adaptor(TA) capability list	
Execute command Syntax **AT+GCAP**	 Response **+GCAP:** list of **<name>**s **OK**
Reference V.25ter	Notes Example: **+GCAP:+FCLASS,+CGSM** **OK**

AT+GCAP : Request complete Terminal Adaptor capability list	**HiLo3G HiLoNC3GPS**
Execute command Syntax **AT+GCAP**	 Response **+GCAP**: list of **<name>**s **OK**
Reference V.25ter	Notes Example: **+GCAP: +CGSM** **OK**

3.11. +GMI Command: Request Manufacturer Identification

AT+GMI : Request manufacturer identification	
Test command Syntax **AT+GMI=?**	 Response **OK**
Execute command Syntax **AT+GMI**	 Response **(manufacturer identification text)** **OK**
Reference V.25ter	Notes **See also AT+CGMI**

3.12. +GMM Command: Request Model Identification

AT+GMM : Request model identification	
Test command Syntax **AT+GMM=?**	 Response **OK**
Execute command Syntax **AT+GMM**	 Response **(model identification text)** **OK**
Reference V.25ter	Notes **See also AT+CGMM**

3.13. +GMR Command: Request Revision Identification

AT+GMR : Request revision identification	
Test command Syntax **AT+GMR=?**	 Response **OK**
Execute command Syntax **AT+GMR**	 Response **(model identification text)** **OK**
Reference V.25ter	Notes **See also AT+CGMR**

3.14. +GSN Command: Request Product Serial Number (IMEI) identical to GSN

AT+GSN : Request International Mobile Equipment Identification (IMEI) identical to GSN	
Test command Syntax **AT+GSN=?**	 Response **OK**
Execute command Syntax **AT+GSN**	 Response **<sn>** (identification text for determination of the individual ME) **OK**
Reference V.25ter	Notes **See also AT+KGSN, AT+CGSN**

3.15. +CMUX Command: Multiplexing Mode

AT+CMUX : Multiplexing Mode	**HiLoV2 HiALL HiLoNC3GPS**
Test command Syntax **AT+CMUX=?**	 Response **+CMUX:** (list of supported **<mode>**s),(list of supported **<subset>**s),(list of supported **<port_speed>**s),(list of supported **<N1>**s),(list of supported **<T1>**s),(list of supported **<N2>**s),(list of supported **<T2>**s),(list of supported **<T3>**s),(list of supported **<k>**s) **OK**
Read Command Syntax **AT+CMUX?**	 Response **+CMUX: <mode>,[<subset>],<port_speed>,<N1>,<T1>, <N2>,<T2>,<T3>[,<k>]** **OK**
Write command Syntax **AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]**	 Response **OK** Parameters **<mode>:** multiplexer Transparency Mechanism 0: Basic option 1: Advanced option **<subset>:** 0 UIH frames used only 1 UI frames used only **<port_speed>:** transmission rate(1-8) 1 9 600 bit/s 2 19 200 bit/s 3 38 400 bit/s 4 57 600 bit/s 5 115 200 bit/s **<N1>:** maximum frame size (Payload size) (31 - 1540) default Value : 31 **<T1>:** acknowledgement timer in units of ten milliseconds 1-254, where 10 is default (100 ms) **<N2>:** maximum number of re-transmissions 0-100, where 3 is default **<T2>:** response timer for the multiplexer control channel in units of ten milliseconds 2-255, where 30 is default (300 ms) **<T3>:** wake up response timer in seconds 1-255, where 10 is default **<k>:** window size, for Advanced operation with Error Recovery options 1-7, where 2 is default

AT+CMUX : Multiplexing Mode	HiLoV2 HiALL HiLoNC3GPS
Reference [27.007] § 5.7	Notes • Multiplexing protocol is described in 3 GPP TS 27 010 • For Maximum Frame Size (N1), it defines the maximum number of octets that that may be contained in information field. It does not include octets added for transparency purposes • See Chapter 18.4 for a summary of Sierra Wireless support

3.16. #CLS Command: Service Class

AT#CLS : Service Class	
Test command Syntax **AT#CLS=?**	 Response **#CLS:** (list of currently available **<class>** s) **OK**
Read command Syntax **AT#CLS?**	 Response **#CLS <class>** **OK**
Write command Syntax **AT #CLS=<class>**	 Response **OK** Parameter **<class> :** 0: for Data mode 1: no effect
Reference Sierra Wireless Proprietary	Notes • Same behavior as +FCLASS command. Needed for Microsoft agreement

3.17. *PSLOCUP Command: Location Update for Mobile Station

AT*PSLOCUP : Generate a location update of the Mobile Station(MS)	HiLoV2 HiAll only
Write command Syntax **AT*PSLOCUP**	 Response **OK** Parameter
Reference Sierra Wireless Proprietary	Notes • This command generates a location update of MS

3.18. *PSCSCN Command: Call State Change Notification

AT*PSCSCN : Call State Change Notification	**HiLoV2 HiAll only**
Read command Syntax **AT*PSCSCN?**	 Response ***PSCSCN: <mode>** **OK**
Write command Syntax **AT*PSCSCN=<mode>**	 Response **OK** Parameter **<Mode> :** 0 Disable presentation of the notification 1 Enable presentation of the notification when the state of a call changes **<Call Id> :** integer type value representing the number of the call 0 when call Id not yet assigned 1..7 for speech calls Greater than 8 for data calls **<State> :** State of the call 0 MO call SETUP (if no control by SIM) 1 MO call SETUP WITH CONTROL BY SIM (accepted) 2 MO call SETUP ERROR (control by SIM rejected or other problem) 3 MO call PROCEED 4 MO call ALERT (at distant) 5 MO call CONNECT (with distant) 6..9 RFU 10 MT call SETUP 11 MT call SETUP ACCEPTED (Bearer capabilities accepted by the ME) 12 MT call SETUP REJECTED (Bearer capabilities rejected by the ME) 13 MT call ALERT 14 MT call CONNECT (ME has successfully accepted the call) 15 MT call CONNECT ERROR (ME was not able to accept the call) 16..19 RFU 20 Call DISCONNECT BY NETWORK 21 Call DISCONNECT BY USER 22 Call REJECT BY USER **Note:** This command uses information available at APPI interface (application i/f). AT parser does not interface directly with protocol stack so it does not have immediate access to L3 messages, this means that **<state>** does not match L3 messages exactly (as they are defined in 24.008 recommendation) **<Status> :** integer representing the status of the call once connected (applicable only for speech calls, either MO or MT) 0 ACTIVE 1 HELD (applicable only for speech calls, either MO or MT) 2 MULTIPARTY ACTIVE (applicable only for speech calls, either

AT*PSCSCN : Call State Change Notification	HiLoV2 HiAll only
	MO or MT) 3 MULTIPARTY HELD (applicable only for speech calls, either MO or MT) **<Number> :** string type phone number of format specified by <type> (same as CLIP or COLP) **<Type> :** type of address octet in integer format (same as CLIP or COLP) **<Line Id> :** Indication of the line 1 Line 1 2 Aux. Line **<CauseSelect> :** integer value representing the Cause Select. See [18.20] for possible values (used in error case or network disconnection) **<Cause> :** integer value representing the Cause. See [18.20] for possible values (used in error case or network disconnection) **<Bearer> :** String (hexadecimal character format) representing bearer capability (for data calls only)
Reference Sierra Wireless Proprietary	Notes • Command allows presentation of information about CS call states • This command does note replace +CLCC command. TE is notify whenever a call state changes, this avoid TE to use polling mechanism with +CLCC command to know the states of each call • Set command enable (or disable) the presentation of*PSCSC: **<Call Id>**, **<State>**, **<Status>**, **[<Number>]**, **[<type>]**, **[<Line Id>]**, **[<CauseSelect>]**, **[<Cause>]**, **[<Bearer>]** every time the states of a call change. The optional fields of the URC are filled only when information is available (i.e. depending of the state of the call), otherwise they are left empty • **Example:** MO speech alerting at distant and initiated on line 1 *PSCSC: 1, 4, 1,,, 1, , , MO speech call connected to “11111111” and active on line 1 *PSCSC: 1, 5, 1, “1111111”, 129, 1, , , MT data call connected to “123456” and active on line 1, BC list=A28881211563A6 *PSCSC: 8, 14, 1, “123456”, 129, 1, , , "A28881211563A6"

3.19. *PSFSNT Command: Field Strength Notification with Threshold

AT*PSFSNT : Field Strength Notification with Threshold	**HiLoV2 HiAll only**
Read command Syntax **AT*PSFSNT?**	 Response ***PSSSNT: <mode>** **OK**
Write command Syntax **AT*PSFSNT=<mode>**	 Response OK Parameter **<mode> :** 0 Disable presentation of the notification 1 Enable presentation of the notification **<Field strength>** 0 less than -110 dBm 1 -109 dBm ...intermediate values... 62 -48dBm 63 greater than -48 dBm 255 field strength is unavailable
Reference Sierra Wireless Proprietary	Notes • **Be careful: these are not the same values as +CSQ** • This command allows presentation of field strength notification • Set command enable (or disable) the presentation of ***PSFS** : <Field strength> each time field strength increase or decrease of 5 dBm

3.20. *PSSSURC Command: Enable Additional Result Code

AT*PSSSURC : Enable additional result code	**HiLoV2 HiAll only**
Test command Syntax **AT*PSSSURC=?**	 Response ***PSSSURC:** (list of supported **<mode>** s) **OK**
Read command Syntax **AT*PSSSURC?**	 Response ***PSSSURC: <mode>** **OK**
Write command Syntax **AT*PSSSURC=<mode>**	 Response **OK** Parameter **<mode>** : 0,1 0 : disable sending of additional result code 1 : enable sending of additional result code
Reference [27.007] § 6.1	Notes • The aim of this AT command is to configure the AT interface to give additional information through result code to TE when D command is entered with an SS string as parameter. When <mode> parameter is enabled,*PSSSURC (resp.*PSSERR) result code is sent to TE before OK (resp. ERROR) result code

3.21. *PSALS Command: Alternate Line Service

AT*PSALS : Alternate Line Service	**HiLoV2 HiAll only**
Test command Syntax **AT*PSALS=?**	 Response ***PSALS:** (list of supported **<line Id>**) **OK**
Read command Syntax **AT*PSALS?**	 Response ***PSALS: <current LineId>** **OK**

AT*PSALS : Alternate Line Service	**HiLoV2 HiAll only**
Write command Syntax **AT*PSALS=<LineId>**	Response **OK** Parameter **<LineId>** : 1 (line 1 - default) 2 line 2 (aux. Line if ALS supported)
Reference Sierra Wireless Proprietary	Notes • This command allows control on alternate line service • For MT (speech) calls, +CRING urc (see +CRC command) indicates on which line call is received: (**+**CRING: VOICE ->default case=line 1, **+**CRING: VOICE_AUX ->□line 2)

3.22. *PSDCIN Command: Diverted Call Indicator Notification

AT*PSDCIN : Diverted Call Indicator Notification	**HiLoV2 HiAll only**
Test command Syntax **AT*PSDCIN=?**	Response ***PSDCIN:** (list of supported **<modes>**),(list of supported **<line>** s) **OK**
Read command Syntax **AT*PSDCIN?**	Response ***PSDCIN: <mode>** **OK**
Write command Syntax **AT*PSDCIN=<mode>** **[, <LineId>]**	Response **[*PSDCIN: <Line Id> , <status> [[...] <CR> <LF>** ***PSDCIN: <Line Id> , <status>]]** **OK** Parameter **<mode>** : parameter set/shows the*PSDCI result code presentation status in the ME 0 (CFU notification presentation disabled) 1 (CFU notification presentation enabled) 2 (query CFU status) **<Line Id> :** 1 (Line 1) 2 (Aux. Line) 3 (data) 4 (fax) (for HiLo V1 only)

AT*PSDCIN : Diverted Call Indicator Notification	HiLoV2 HiAll only
	<status> : 0 (not active) 1 (active)
Reference [27.007] § 6.1	Notes • This command allows presentation of diverted call indicator • Set command enables/disables the presentation of notification result code from ME to TE. If **<mode>** =2 status of **<Line Id>** is requested. If **<Line Id>** is not provided , query is requested for all lines • When **<mode>** =1,*PSDCI : **<Line Id>**, **<status>** Diverted Call Indication result code is sent to TE on reception of network notification. (Several result code can been sent at the same time on reception of the notification)

3.23. *PSMBNB Command: Mailbox Numbers

AT*PSMBNB : Mailbox Numbers	HiLoV2 HiAll only
Test command Syntax **AT*PSMBNB=?**	 Response ***PSMBNB: (list of supported <Line Id>),(List of supported type>), [<nlength>],[<tlength>]** **OK**
Read command Syntax **AT*PSMBNB?**	 Response **[*PSMBNB: <Line Id> , <number> , <type> , <text> [[...] <CR> <LF>** ***PSMBNB: <Line Id> , <number> , <type> , <text>]]** **OK**
Write command Syntax **AT*PSMBNB=<Line Id> [, <number> , <type> [, <text>]]**	 Response **OK** Parameter **<Line Id> :** 1 (Line 1) 2 (Aux. Line) 3 (data) 4 (fax)（for HiLo V1 only） **<number> :** string type phone number of format <type> **<type> :** type of address octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.7) ; default 145 when dialing string includes international access code character "+", otherwise 129 **<text> :** string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS **<nlength> :** integer type value indicating the maximum length of field <number> **<tlength> :** integer type value indicating the maximum length of field <text>

AT*PSMBNB : Mailbox Numbers	HiLoV2 HiAll only
Reference Sierra Wireless Proprietary	Notes • The number to the voice mail server is set with this command. If setting fails, a ME error, +CME ERROR: <err> is returned. If only <Line Id> is present in command corresponding record is deleted in SIM • The purpose of this command is not to replace +CSVM command but to offer more possibilities for Mailbox numbers settings (+CSVM command allows only voice mailbox settings)

3.24. *PSCSP Command: Customer Service Profile

AT*PSCSP : Customer Service Profile	HiLoV2 HiAll only
Test command Syntax **AT*PSCSP=?**	 Response ***PSCSP:** (list of supported **<Service Groupe code>**) **OK**
Read command Syntax **AT*PSCSP?**	 Response **[*PSCSP: <Service Groupe code> , <status> [[...] <CR> <LF>** ***PSCSP: <Service Groupe code> , <status>]]** **OK**
Write command Syntax **AT*PSCSP**	 Response **OK** Parameter **<Service Groupe code> :** string representing the hexadecimal value of the Service Group Code **<status> :** string representing a record of the CSP sim file (8 bit bitfield)
Reference Sierra Wireless Proprietary	Notes • This command is reserved for future use • Set command has no effect • **Example:** *PSCSP: "02", "11000000" ... *PSCSP: "C0", "11000110" OK

3.25. *PSSEAV Command: Service Availability

AT*PSSEAV : Service Availability	**HiLoV2 HiAll only**
Test command Syntax **AT*PSSEAV=?**	 Response ***PSSEAV:** (list of supported modes),(list of supported services) **OK**
Read command Syntax **AT*PSSEAV?**	 Response ***PSSEAV: <mode>** **OK**
Write command Syntax **AT*PSSEAV=<mode>**	 Response **OK** Parameter **<mode> :** parameter set/shows the *PSREADY result code presentation status in the ME parameter 0 (disabled) 1 (enabled) **<service> :** 0 (phone book service availability) 1 (SMS service availability) 2 (SMS-CB service availability)
Reference [27.007] § 6.1	Notes • Set command enables/disables the presentation of notification result code from ME to TE. When **<mode>** =1,*PSREADY: **<service>** result code is sent to TE when **<service>** is available

3.26. *PSCHRU Command: Channel Registration URC

AT*PSCHRU : Channel Registration and filters for URC	**HiLoV2 HiAll only**
Test command Syntax **AT*PSCHRU=?**	 Response ***PSCHRU:** (list of supported **<mask>** s) **OK**
Read command Syntax **AT*PSCHRU?**	 Response ***PSCHRU: <mask>** **OK**

AT*PSCHRU : Channel Registration and filters for URC	**HiLoV2 HiAll only**
Write command Syntax **AT*PSCHRU=<mask>**	 Response **OK** Parameter **<mask>** : mask used to filter URCs 0: No URC will be displayed on the channel 1: CALL related URC 2: SMS related URC 4: CBM related URC 8: CIEV related URC 16: NET_REG related URC 32: SS related URC 64: INIT related URC 128: DBG related URC 256: STK related URC
Reference Sierra Wireless Proprietary	Notes • This command is used to filter one or several URC on a channel. By default all URC are enabled on a newly opened channel • This command only applies on the channel which is submitted, other channels are not impacted • **Example:** To enable the display of URC SMS (2) and CALL(1) and to forbid the display of the others on a channel, choose 2 and 1 parameter, i.e. AT*PSCHRU=3 • The table below lists each mask and the URCs they are associated with:

Mask	URC list
1	RING, CRING, +CCM, +CCWV, +CCWA, +CLIP, +COLP, +CSSI, +CSSU, *PSCALL, *PSDCI
2	+CDS, +CMT, +CMTI, *PSMWI
4	+CBM
8	+CIEV
16	+CREG, +CGREG
32	+CUSD
64	*PSREADY
128	*PSDBG
256	*PSSTK

3.27. *PSCSSC Command: Call Successful Setup Control

AT*PSCSSC : Call successful setup control	**HiLoV2 HiAll only**
Read command Syntax **AT*PSCSSC?**	 Response ***PSCSSC: <mode>** **OK**

AT*PSCSSC : Call successful setup control	**HiLoV2 HiAll only**
Write command Syntax **AT*PSCSSC=<mode>**	Response **OK** Parameter **<mode> :** 0 : OK is returned after call is connected to the called party (successful call setup) 1 : default mode, OK is returned when call setup is started .The user is not informed of call successful setup. If the calls fails, NO_ANSWER or NO_CARRIER will be sent after the OK
Reference Sierra Wireless Proprietary	Notes • This command controls the emission of the result code for MO speech successful setup • If "Connected line identification presentation" supplementary service is activated (refer to +COLP), result code for ATD command will be sent to TE when call is connected to the called party (successful call setup) • If “Connected line identification presentation” supplementary service is NOT activated (refer to +COLP), result code for ATD can be sent as soon as call setup is started or after call is connected to the called party (after (successful call setup) • Set command allows selection of <mode> for MO speech call result code • If user set **<mode>** =1 when +COLP is also activated, ERROR will be returned. Mode will remains to 0 • Read command returns current **<mode>**

3.28. *PSSMPH Command: SIM Phase

AT*PSSMPH : Get SIM phase	**HiLoV2 HiAll only**
Test command Syntax **AT*PSSMPH=?**	 Response ***PSSMPH: (list of supported <phase>s)**
Read command Syntax **AT*PSSMPH?**	Get supported SIM phase Response ***PSSMPH: <phase>** Parameters **<phase> :** 0 Unknown 1 Phase 1 2 Phase 2 3 Phase 2+
Reference Sierra Wireless Proprietary	Notes • This commands is used to get current (U)SIM phase

3.29. *PSCIPH Command: Ciphering Notification

AT*PSCIPH : Set ciphering notification	**HiLoV2 HiAll only**
Test command Syntax **AT*PSCIPH=?**	 Response ***PSCIPH: (list of supported <mode>s), (list of supported <Ciphering status>s)**
Read command Syntax **AT*PSCIPH?**	Get current state Response ***PSCIPH: <mode>, <Ciphering status>** Parameters **<mode> :** 0 Disable ciphering notification 1 Enable ciphering notification **<Ciphering status> :** 0 Ciphering is OFF 1 Ciphering is ON

AT*PSCIPH : Set ciphering notification	HiLoV2 HiAll only
Write command Syntax **AT*PSCIPH=<mode>**	Set mode Response **OK**
Reference Sierra Wireless Proprietary	• Set command is used to enable or disable presentation of ciphering status notification (*PSCP). Notification is sent each time ciphering status changes • Example: *PSCP: 1

3.30. +KBLVER Command: Request the BootLoader Version

AT+KBLVER : Request the BootLoader version	HiLo3G HiLoNC3GPS
Test command Syntax **AT+KBLVER=?**	 Response **OK**
Execute command Syntax **AT+KBLVER**	 Response **(BootLoader version text)** **OK**
Reference Sierra Wireless Proprietary	Notes

4. Call Control Commands

4.1. A Command: Answer a Call

ATA : Answer a call	
Execute command Syntax **ATA**	 Response **CONNECT[<text>]** Data Connection established **OK** Voice Connection established or if cancellation of the command **ERROR** Response if no connection
Reference V.25Ter	Notes

4.2. H Command: Disconnect Existing Connection

ATH : Disconnect existing connection	
Execute command Syntax **ATH[<type>]**	 Response: **OK** Parameters **<type>:** Type of call affected by ATH request. Voice call disconnection is also dependent of +CVHU settings 0: Same behavior as without parameter. Disconnect ALL calls on the channel the command is requested. All active or waiting calls, CS data calls, GPRS call of the channel will be disconnected 1: Disconnect all calls on ALL connected channels. All active or waiting calls, CSD calls, GPRS call will be disconnected (cleanup of all calls of the ME) 2: Disconnect all connected CS data call only on the channel the command is requested (Speech calls (active or waiting) or GPRS calls are not disconnected) 3: Disconnect all connected GPRS calls only on the channel the command is requested (Speech calls (active or waiting) or CS data calls are not disconnected) 4: Disconnect all CS calls (either speech or data) but does not disconnect waiting call (either Speech or data) on the channel the command is requested 5: Disconnect waiting call (either speech or data) but does not disconnect other active calls (Either CS speech, CS data or GPRS) on the channel the command is requested. (rejection of incoming call)
Reference V.25Ter	Notes • See 18.16: Appendix 16: ATH Command Behavior • See also AT+CHLD

4.3. D Command: Mobile Originated Call to Dial a Number

ATD : Mobile originated Call to dial a number	
Test command Syntax **ATD=?**	 Response **1 2 3 4 5 6 7 8 9 0 * # + A B C D T** **OK**
Read command Syntax **ATD?**	 Response **1 2 3 4 5 6 7 8 9 0 * # + A B C D T** **OK**
Execute command Syntax **ATD[<n>][;]**	 Response **NO DIALTONE** **BUSY** **NO CARRIER** The connection cannot be established **NO ANSWER** **CONNECT[<text>]** Data connection successfully connected **OK** If successfully connected and voice call Parameters **<n>:** String of dialing digits and optionally V.25ter modifiers (dialing digits): 0-9, * , #, +, A, B, C (maximum length: 20 digits) **<;>:** Only required to set up voice calls. TA remains in command mode
Reference V.25Ter	Notes • The command may be aborted generally when receiving an ATH command during execution • Same behavior for ATDT, ATPD, ATRD, ATTD • OK answer may arrive just after the ATD command or after the call is actually active (see AT+COLP)

4.4. D>: Direct Dialing from Phonebook

ATD> : Direct dialing from phonebook	
Execute command Syntax **ATD><str>[;]** **ATD>[<mem>]<n>[;]**	 Response See ATD Parameters **<str>:** alphanumeric field (if possible all available memories should be searched for correct entry) **<mem>:** memory storage ("ME", "SM"…) **<n>:** entry location

ATD> : Direct dialing from phonebook	
Reference [27.007] § 6.2	Notes • For memory storage locations, see AT+CPBS

4.5. +CHUP Command: Hang up Call

AT+CHUP : Hang up call	
Execute command Syntax **AT+CHUP**	 Response **OK**
Test command Syntax **AT+CHUP=?**	 Response **OK**
Reference [27.007] § 6.5	Notes • "AT+CHUP" Hang up waiting/active MT calls and MO calls

4.6. +CRC Command: Set Cellular Result Codes for Incoming Call Indication

AT+CRC : Set Cellular Result Codes for incoming call indication	
Test command Syntax **AT+CRC=?**	 Response **+CRC:** (list of supported **<mode>**) **OK**
Read command Syntax **AT+CRC?**	 Response **+CRC:<mode>** **OK**
Write command Syntax **AT+CRC=[<mode>]**	 Response **OK** Parameters **<mode>:** 0: disable extended format 1: enable extended format
Reference [27.007] § 6.11	Notes • When enabled, an incoming call is indicated with **+CRING: <type>** **<type> :FAX** or **VOICE** or **ASYNC** • Fax is for HiLo V1 only, not supported in HiLo V2, HiLo3G and HiLoNC3GPS

4.7. +CSTA Command: Select Type of Address

AT+CSTA : Select type of address	
Test command Syntax **AT+CSTA=?**	 Response **+CSTA:** (list of supported **<type>** s) **OK**
Read command Syntax **AT+CSTA?**	 Response **+CSTA: <type>** **OK**
Write command Syntax **AT+CSTA=[<type>]**	 Response **OK** Parameter **<type> :** 129 (default) National type of address 145 International type of address: Dialing string includes international access code character "+" See Data impacted by &F and &V for default values
Reference [27.007] § 6.1	Notes

4.8. +CMOD Command: Call Mode

AT+CMOD : Call mode	
Test command Syntax **AT+CMOD=?**	 Response **+CMOD:** (list of supported **<mode>** s) **OK**
Read command Syntax **AT+CMOD?**	 Response **+CMOD: <mode>** **OK**
Write command Syntax **AT+CMOD=[<mode]**	 Response **OK** Parameter **<mode> :** 0 : single mode (default value) See Data impacted by &F and &V for default values

AT+CMOD : Call mode	
Reference [27.007] § 6.4	Notes Only single mode is supported In [27.007] document, <mode> can be either single or alternating (more than one basic service (voice, data, fax) within one call)

4.9. +CEER Command: Extended Error Report

AT+CEER : Extended error report	
Test command Syntax **AT+CEER=?**	 Response **OK**
Write command Syntax **AT+CEER**	 Response **+CEER: <report>** **OK** Parameter **<report> :** Cause Select: **<cause_select>** cause: **<cause>** " **<cause select>** **<cause>** 0: No cause 0: No cause 16: Service provider 0: Unknown 1: Not Allowed 2: No cause 6: Wrong parameter 9: Network access not allowed 20: all call instances are used 21 ACM over ACM Max 22 invalid AOC element 23 SIM increase not allowed 24 switch off 25 Unknown call id 28 barred

AT+CEER : Extended error report	
Write command Syntax **AT+CEER**	65: Local cause 1: state error 2: no call entity 3: wrong TI 6: DTMF buffer overflow 7: call disconnected 17: No cell available 32: Local rejection 33: PLMN not allowed 34: emergency call not possible 35: authentication rejected 36: network rejection 37: LA not allowed 38: Local timeout 39: server congestion 40: local data rejection 48: failed replace PDP context 66: MM network cause See **[04.08]** 67: CC network cause See **[04.08]** 69: RP cause See **[04.08]** 71: SIM cause 0: Unknown problem 1: Memory problem 2: File Id not found 6: Increase problem 7: Technical problem

AT+CEER : Extended error report	
Write command Syntax **AT+CEER**	11: Command not allowed 15: SIM card out 73: SM cause See **[04.08]**
Reference [27.007] § 6.10	Notes • No GPRS error causes are display • See Data impacted by &F for default value

AT+CEER : Extended error report	HiLo3G HiLoNC3GPS
Test command Syntax **AT+CEER=?**	 Response **OK**
Write command Syntax **AT+CEER**	 Response **+CEER: <report>** **OK** <report>: the total number of characters, including line terminators, in the information text shall not exceed 2041 characters Text shall not contain the sequence 0<CR> or OK<CR> Execution command causes the TA to return one or more lines of information text <report>, determined by the MT manufacturer, which should offer the user of the TA an extended report of the reason for: - the failure in the last unsuccessful call setup (originating or answering) or in-call modification; - the last call release; - the last unsuccessful GPRS attach or unsuccessful PDP context activation; - the last GPRS detach or PDP context deactivation Typically, the text will consist of a single line containing the cause information given by GSM/UMTS network in textual format
Reference [27.007] § 6.10	

4.10. +CVHU Command: Voice Hang Up Control

AT+CVHU : Voice hang up control	
Test command Syntax **AT+CVHU=?**	 Response **+CVHU: (list of supported <mode> s)** **OK**

AT+CVHU : Voice hang up control	
Read command Syntax **AT+CVHU?**	 Response **+CVHU: <mode>** **OK**
Write command Syntax **AT+CVHU=[<mode>]**	 Response **OK** Parameter 0 "Drop DTR" ignored but OK response given. ATH disconnects 1 "Drop DTR" and ATH ignored but OK response given 2 "Drop DTR" behavior according to &D setting. ATH disconnects
Reference [27.007] § 6.20	Notes • If DTR signal is inactive (if DTR is not a pulse), then “Drop DTR” does not respond "OK"

4.11. +KFILTER Command: Create a Filter for Incoming Calls

AT+KFILTER : Create a filter for incoming calls	
Read command Syntax **AT+KFILTER?**	 Response **+KFILTER: <num1> [,<num2> [,<num3> [,<num4> [,<num5>]]]]** **OK**
Write command Syntax **AT+KFILTER=<num> [,<num2> [,<num3> [,<num4> [,<num5>]]]]**	 Response **OK** Parameters **<num>:** string type phone number. A filter will be created with this phone number and all the others ones will be rejected

AT+KFILTER : Create a filter for incoming calls	
Reference Sierra Wireless Proprietary	Notes • To disable the filter, <num> has to be an empty string • CLIP has to be supported by the network • This filter tries to match the clip beginning by the last digit of the phone number • If the module reboots <num 1>, <num 2>,<num 3>,<num 4>,<num 5> are saved • After a software upgrade, <num2>, <num3>, <num4>, <num5> are erased, and <num1> will be erased or restored depending on the parameter file • If flash memory is full, <num2>, <num3>, <num4>, <num5> can't be saved Example AT+KFILTER="89" -> set 1 filter number AT+KFILTER="234","5345","87655789" -> set 3 filter numbers AT+KFILTER="11","3233","739","8447","65532" -> set 5 filter numbers AT+KFILTER="" -> disable the filter (all filter numbers will be deleted) AT+KFILTER? -> read the filter numbers

4.12. +CSNS Command: Single Numbering Scheme

AT+CSNS : Single numbering scheme	
Test command Syntax **AT+CSNS=?**	 Response **+CSNS:** (list of supported **<mode>**) **OK**
Read command Syntax **AT+CSNS?**	 Response **+CSNS:<mode>** **OK**
Write command Syntax **AT+CSNS=[<mode>]**	 Response **OK** Parameters **<mode>:** 0: Voice 2: Fax (for HiLo V1 only) 4: Data
Reference [27.007] § 6.19	Notes See also AT+CBST

4.13. +KATH Command: Select ATH Mode

AT+KATH : Select ATH Mode	**HiLoV2 HiAll only**
Test command Syntax **AT+KATH=?**	 Response **+KATH:** (list of supported **<num>**) **OK**
Read command Syntax **AT+KATH?**	 Response **+KATH:<num>** **OK**
Write command Syntax **AT+KATH=<num>**	 Response **OK** Parameters **<num>:** 0 Default (User Busy) 17 User Busy 18 No User Responding 19 No Answer 21 Call Rejected 27 Destination Out of order
Reference Sierra Wireless Proprietary	Notes • This command selects the disconnect type sent to the network on AT+ATH cmd • These values follow 24.008 3GPP specification (Table 10.5.123)

5. Mobile equipment control and status Commands

5.1. +CACM Command: Accumulated Call Meter (ACM) Reset or Query

AT+CACM : Accumulated call meter (ACM) reset or query	
Test command Syntax **AT+CACM=?**	 Response **OK**
Read command Syntax **AT+CACM?**	 Response **+CACM: <acm> (current acm value)** **OK**
Write command Syntax **AT+CACM=<password>** (reset the value)	 Response **OK** Parameters **<password>:** SIM PIN2
Reference [27.007] §8.25	Notes • This AT command needs SIM and network where AOC are allowed

5.2. +CAMM Command: Accumulated Call Meter Maximum (ACM max) Set or Query

AT+CAMM : Accumulated call meter maximum (ACM max) set or query	
Test command Syntax **AT+CAMM=?**	 Response **OK**
Read command Syntax **AT+CAMM?**	 Response **+CAMM: <acmmax>** **OK**

AT+CAMM : Accumulated call meter maximum (ACM max) set or query	
Write command Syntax **AT+CAMM= [<acmmax>[,<passwd>]]**	Response **+CAMM: <acmmax>** **OK** Parameters **<acmmax>:** string type; three bytes of the max ACM value in hexadecimal format 0 disables ACMmax feature **<passwd>:** SIM PIN2
Reference [27.007] § 8.26	Notes • This AT command needs SIM and network where AOC are allowed

5.3. +CCWE Command: Call Meter Maximum Event

AT+CCWE : Call meter maximum event	
Test command Syntax **AT+CCWE=?**	Response **+CCWE:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CCWE?**	Response **+CCWE: <mode>** **OK**
Write command Syntax **AT+CCWE=<mode>**	Response **OK** Parameter **<mode>:** 0: Disable the call meter warning event 1: Enable the call meter warning event
Reference [27.007] §8.28	Notes • When enabled, a notification (+CCWV) is sent shortly (approx. 30s) before the ACM max is reached • This AT command needs SIM and network where AOC are allowed

5.4. +CALA Command: Set Alarm

AT+CALA : Set alarm time	
Test command Syntax **AT+CALA=?**	 Response **+CALA: <time>**,(list of supported **<n>**s),(list of supported **< recurr >**s) **OK**
Read command Syntax **AT+CALA?**	 Response **[+CALA: <time>,<n1>,[<recurr>]<CR><LF>** **[+CALA: <time>,<n2>,[<recurr>]<CR><LF>** **OK**
Write command Syntax **AT+CALA=<time>[,<n>[,<recurr>]]**	 Response **OK** Parameters **<time>:** internal clock (Cf. +CCLK). String type "hh:mm:ss" if <recurr> is present or "yy/mm/dd,hh:mm:ss" if not **<n>:** index of the alarm (range 1 to 4 for now) **<recurr>:** integer type value indicating day of week for the alarm in one of the following formats: <1..7>[,<1..7>[…]] – Sets a recurrent alarm for one or more days in the week. The digits 1 to 7 corresponds to the days in the week, Monday(1), …, Sunday (7) 0 – Sets a recurrent alarm for all days in the week
Reference [27.007] §8.16	Notes • To set up a recurrent alarm for one or more days in the week, the <recurr>-parameter may be used • When an alarm is timed out and executed, the unsolicited result code **+CALV**: **<n>** is returned • When woken up by an alarm, the module is fully started. It is the responsibility of the host to turn it off and to set a new alarm if recurrent alarms are not used • Only for not recurrent alarm : if date and hour are over , +CME ERROR: 4 is returned • After *PSCPOF or +CPOF command, **+CALV:** correctly received if autobaud speed is not selected Examples - AT+CALA="07/04/11,11:34:25" -> set a one shot alarm saved at index 1 for the specified date and time - AT+CALA="07/04/11,11:34:00" ,3 -> set a one shot alarm saved at index 3 for the specified date and time - AT+CALA="11:50:45" ,1,1,4 -> set a recurrent alarm saved at index 1 for every Sunday and Wednesday at 11:50:45

5.5. +CALD Command: Delete Alarm

AT+CALD : Delete alarm	
Test command Syntax **AT+CALD=?**	 Response **+CALD: (list of supported <n>s)** **OK**
Write command Syntax **AT+CALD=<n>**	 Response **OK** Parameters **<n>:** index of the alarm
Reference [27.007] §8.38	Notes • Action command deletes an alarm in the MT

5.6. +CCLK Command: Real Time Clock

AT+CCLK : Real time clock	
Test command Syntax **AT+CCLK=?**	 Response **OK**
Read command Syntax **AT+CCLK?**	 Response **+CCLK: <time>** OK
Write command Syntax **AT+CCLK=<time>**	 Response **OK** Parameter **<time>:** string type value; format is "yy/MM/dd,hh:mm:ss+/-Timezone", where characters indicate year (last two digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -96...+96). E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"
Reference [27.007] § 8.15	Notes • NITZ information is taken into account when available

5.7. *PSCPOF Command: Power Off

AT*PSCPOF : Power off	**HiLoV2 HiAll only**
Execute command Syntax **AT*PSCPOF**	 Response **OK**
Reference	Notes • This command allows switching off the mobile. Note that "**OK**" result code will appear immediately if the command is accepted and power off will occur after that. Unexpected random characters may also be issued during switch off of MS

5.8. +CPOF Command: Power Off

AT+CPOF : Power off	**HiLo3G HiLoNC3GPS**
Execute command Syntax **AT+CPOF**	 Response **OK**
Reference	Notes • This command allows switching off the mobile. Note that "**OK**" result code will appear immediately if the command is accepted and power off will occur after that. Unexpected random characters may also be issued during switch off of MS

5.9. +CIND Command: Indicator Control

AT+CIND : Indicator control	
Test command **Syntax** **AT+CIND=?**	 Response **+CIND: ("battchg",(0-5)),("signal",(0-4)),("service",(0-1)),("message",(0-1)),("call",(0-1)),("roam",(0-1)),("smsfull",(0-1))** **OK**
Read command Syntax **AT+CIND?**	 Response **+CIND: <battchg>,<signal>,<service>,<call>, <smsfull>** **OK** Parameters **<battchg>:** battery charge level (0-5) 0 low level, 4 high level, 5 means that the battery is charging (not supported) **<signal>:** signal quality (0-4) 0 low level signal, 4 high level signal

AT+CIND : Indicator control	
Read command Syntax **AT+CIND?**	**<service>:** service availability (0-1) **<message>:** Message received (0-1) **<call>:** call in progress (0-1) **<roam>:** Roaming indicator (0-1) 0: Home net 1: Roaming **<smsfull>:** SMS memory storage (0-1) 0: Memory available 1: Memory full
Reference [27.007] § 8.9	Notes • <smsfull> indication not available on all products

AT+CIND : Indicator control	**HiLo3G HiLoNC3GPS**
Test command Syntax AT+CIND=?	Response **+CIND: ("battchg",(0-5)),("signal",(0-5)),("service",(0-1)),("message",(0-1)),("call",(0-1)),("roam",(0-1)),("smsfull",(0-1)), ("GPRS coverage",(0-1)),("callsetup",(0-3))** **OK**
Read command Syntax **AT+CIND?**	Response **+CIND: <battchg>,<signal>,<service>,<message>,<call>,<roam>,<smsfull>, <GPRS coverage>, <callsetup>** **OK** Parameters **<battchg>:** battery charge level: (0-5) **<signal>:** signal quality: (0-5) **<service>:** service availability (GSM): (0-1) **<message>:** Message received: (0-1) **<call>:** call in progress: (0-1) **<roam>:** Roaming indicator: (0-1) 0: Home net 1: Roaming **<smsfull>:** SMS memory storage (0-1) 0: Memory available 1: Memory full **<GPRS coverage>:** GPRS attached status (0-1) 0: detached status 1: attached status **<callsetup>:** call setup status (0-3) 0: No active call setup 1: MT call is waiting of ringing 2: MO call was initiated 3: MO call ringing at B-party

AT+CIND : Indicator control	HiLo3G HiLoNC3GPS
Reference [27.007] § 8.9	Notes • <smsfull> indication not available on all products

5.10. +CLAC Command: List Available AT Commands

AT+CLAC : List all available AT commands	
Execute command Syntax **AT+CLAC**	 Response List of all supported AT Commands **+CLAC: <CR> <LF>** **<AT Command1><CR> <LF>** **<AT Command2><CR> <LF> […]]** **OK** Parameters
Reference [27.007] § 8.37	Notes • This command provides the AT Command list available for the user

5.11. +CMEC Command: Mobile Equipment Control Mode

AT+CMEC : Mobile Equipment control mode	
Test command Syntax **AT+CMEC=?**	 Response **+CMEC:** (list of supported **<keyp>**s),(list of supported **<disp>**s),(list of supported **<ind>**s) **OK**
Read command Syntax **AT+CMEC?**	 Response **+CMEC: <keyp>,<disp>,<ind>** **OK**

AT+CMEC : Mobile Equipment control mode	
Write command Syntax **AT+CMEC=[<keyp>[, <disp>[,<ind>]]]**	 Response **OK** Parameters **<keyp>:** 0: keypad management, not significant for HiLo (no keypad) **<disp>:** 0: display management, not significant for HiLo (no display) **<ind>:** 0: only ME can set the status of its indicators (command +CIND can only be used to read the indicators)
Reference [27.007] § 8.6	Notes • Set command selects the equipment, which operates ME keypad, writes to ME display and sets ME indicators

5.12. +CFUN Command: Set Phone Functionality

AT+CFUN : Set phone functionality	
Test command Syntax **AT+CFUN=?**	 Response **+CFUN:** (list of supported **<fun>**s), (list of supported **<rst>**s) **OK**
Read command Syntax **AT+CFUN?**	 Response **+CFUN: <fun>** **OK**
Write command Syntax **AT+CFUN=[<fun>[,<rst>]]**	 Response **OK** Parameters **<fun>:** 1 full functionality 2 disable phone transmit RF circuits only (not support) 3 disable phone receive RF circuits only (not support) 4 disable phone both transmit and receive RF circuits **<rst>:** 0: Set the ME to <fun> power level immediately This is the default when <rst> is not given(not support); 1: reset the MT before setting it to <fun> power level
Reference [27.007] § 8.2	Notes • AT+CFUN=1,1 generates a blocking defense to reset the mobile. "OK" result code will appear after reset has been completed (AT+CFUN=1,1 has no effect on radio on/off, it leaves it has is was before reset)

AT+CFUN : Set phone functionality	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+CFUN=?**	 Response **+CFUN:** (list of supported **<fun>**s), (list of supported **<rst>**s) **OK** **+CFUN: (0-1,4-7), (0-1)**
Read command Syntax **AT+CFUN?**	 Response **+CFUN: <fun>** **OK**
Write command Syntax **AT+CFUN=[<fun>[,<rst>]]**	 Response **OK** Parameters **<fun>:** 0 Low Power Mode - Protocols are deactivated (no RF), but able to go to ONLINE, since RFcal/ provisioning is ok - Typically used for airplane mode or charge-only mode - All tasks are still running fine 1 Normal functionality; - Protocols are fully activated. Normal operation
Write command Syntax **AT+CFUN=[<fun>[,<rst>]]**	 4 Disable both transmit and receive RF circuits - just for disabling Tx & Rx RF off 5 Factory Test Mode - Protocols are activated in FTM mode - This is only for RF calibration purpose only - All tasks are running like ONLINE or LPM 6 Reset UE : - will power-cycle the phone 7 Offline mode - Protocols are deactivated(no RF) - No activity is allowed at all, except power-off or power-cycle, since RF was not calibrated or phone was not provisioned properly - Even all (or most) of tasks are in offline. Similar to power-off, but power is still there **<rst>:** 0: Set the ME to <fun> power level immediately This is the default when <rst> is not given(not support) 1: reset the MT before setting it to <fun>power level

AT+CFUN : Set phone functionality	**HiLo3G HiLoNC3GPS**
Reference [27.007] § 8.2	Notes • AT+CFUN=1,1 generates a software defense to reset the mobile. “OK” result code will appear after reset has been completed. (AT+CFUN=1,1 has no effect on radio on/off, it leaves it as it was before reset)

5.13. +CMER Command: Mobile Equipment Event Reporting

AT+CMER : Mobile Equipment event reporting	
Test command Syntax **AT+CMER=?**	 Response **+CMER:** (list of supported **<mode>**s),(list of supported **<keyp>**s),(list of supported **<disp>**s),(list of supported **<ind>**s),(list of supported **<bfr>**s) **OK**
Read command Syntax **AT+CMER?**	 Response **+CMER: <mode>,<keyp>,<disp>,<ind>,<bfr>** **OK**
Write command Syntax **AT+CMER=[<mode>[,<keyp>[,<disp>[,<ind>[,<bfr>]]]]]**	 Response **OK** Parameters **<mode>:** 0: buffer unsolicited result codes in the TA; if TA result code buffer is full, codes can be buffered in some other place or the oldest ones can be discarded. 1: discard unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE **<keyp>:** 0: no keypad event reporting **<disp>:** 0: no display event reporting **<ind>:** 0: no indicator event reporting 1: indicator event reporting using result code +CIEV: <ind>,<value>. <ind> indicates the indicator order number (as specified for +CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by +CIND shall be indicated by the TA to the TE 2: indicator event reporting using result code +CIEV: <ind>,<value>. All indicator events shall be directed from TA to TE **<bfr>:** 0: TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1 is entered
Reference [27.007] § 8.10	Notes

5.14. +CMEE Command: Report Mobile Termination Error

AT+CMEE : Report Mobile Termination Error	
Test command Syntax **AT+CMEE=?**	 Response **+CMEE:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CMEE?**	 Response **+CMEE: <n>** **OK**
Write command Syntax **AT+CMEE=[<n>]**	 Response **OK** Parameter **<n>:** 0: disable +CME ERROR: <err> result code and use ERROR instead 1: +CME ERROR: <err> result code and use numeric <err> values 2: +CME ERROR: <err> result code and use verbose <err> values
Reference [27.007] § 9.1	Notes • See Data impacted by &F and &V for default value

5.15. +CMUT Command: Mute Control

AT+CMUT : Mute control	
Test command Syntax **AT+CMUT=?**	 Response **+CMUT:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CMUT?**	 Response **+CMUT: <n>** **OK**
Write command Syntax **AT+CMUT=<n>**	 Response **OK** Parameter **<n>:** 0 mute off 1 mute on

AT+CMUT : Mute control	
Reference [27.007] § 8.24	Notes • Be careful, this command can only be used during voice call

5.16. +CPIN Command: Enter Pin

AT+CPIN : Enter pin	
Test command Syntax **AT+CPIN=?**	 Response **OK**
Read command Syntax **AT+CPIN?**	 Response **+CPIN: <code>** **OK**
Write command Syntax **AT+CPIN=<pin>** **[,<newpin>]**	 Response **OK** Parameters **<code>:** values reserved by this TS: READY — ME is not pending for any password SIM PIN — ME is waiting for SIM PIN to be given SIM PUK — ME is waiting for SIM PUK to be given. A second pin, <newpin>, is used to replace the old pin in the SIM and should thus be supplied SIM PIN2 — ME is waiting SIM PIN2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that ME does not block its operation) SIM PUK2 — ME is waiting SIM PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that ME does not block its operation). Also, a second pin, <newpin>, is used to replace the old pin in the SIM and should thus be supplied PH-NET PIN — ME is waiting personalization password to be given **<pin>, <newpin>:** string type value (8 characters max.)
Reference [27.007] § 8.3	Notes • Parameter <newpin> can only be used if SIM is PIN blocked. <pin> must be PUK. Otherwise, the command is rejected • If the SIM card is extracted, AT+CPIN? will answer with a maximum of 30 seconds

5.17. *PSPRAS Command: PIN Remaining Attempt Status

AT*PSPRAS : PIN Remaining Attempt Status	**HiLoV2 HiAll only**
Test command Syntax **AT*PSPRAS=?**	 Response ***PSPRAS:** (list of supported **<code>)** **OK**
Read command Syntax **AT*PSPRAS?**	 Response ***PSPRAS: < pin1>, <puk1>,<pin2>,<puk2>** **OK**
Write command Syntax **AT*PSPRAS**	 Response **OK** Parameters **<pin1>:** integer type value indicating the number of false presentations remaining for PIN1. The maximum value is 3, and the minimum value is 0. Zero means that the PIN1 is blocked **<puk1>:** integer type value indicating the number of false presentations remaining for PUK1. The maximum value is 10, and the minimum value is 0. Zero means that the PUK1 is blocked **<pin2>:** integer type value indicating the number of false presentations remaining for PIN2. The maximum value is 3, and the minimum value is 0. Zero means that the PIN2 is blocked **<puk2>:** integer type value indicating the number of false presentations remaining for PUK2. The maximum value is 10, and the minimum value is 0. Zero means that the PUK2 is blocked **<code>:** "SIM PIN1", "SIM PUK1", "SIM PIN2", "SIM PUK2"
Reference Sierra Wireless proprietary command	Notes • This commands returns information about the number of codes attempts remaining • Set command has no effect (return OK) • If MT is waiting SIM PIN or SIM PUK to be given, the returned value of <pin2> and <puk2> is invalid

5.18. +CPUC Command: Price Per Unit and Currency

AT+CPUC : Price per unit and currency table
Test command Syntax **AT+CPUC=?**	 Response **OK**

AT+CPUC : Price per unit and currency table	
Read command Syntax **AT+CPUC?**	 Response **+CPUC: <currency>,<ppu>** **OK**
Write command Syntax **AT+CPUC=<currency>, <ppu>[,<passwd>]**	 Response **OK** Parameters **<currency>:** string type; three-character currency code (e.g. .GBP., .DEM.);character set as specified with AT+CSCS **<ppu>:** string type; price per unit; dot is used as a decimal separator (e.g. .2.66.). The length is limited to 20 characters. If the string length is exceeded, the command is terminated with an error. This string may only contain digits and a dot. Leading zeros are removed from the string **<passwd>:** string type; SIM PIN2. String parameter which can contain any combination of characters. The maximum string length is limited to 8 characters
Reference [27.007] § 8.27	Notes • This AT command needs SIM and network where AOC are allowed

5.19. +CPWC Command: Power Class

AT+CPWC : Power class	
Test command Syntax **AT+CPWC=?**	 Response **+CPWC:** list of supported (**<band>**,(list of **<class>**s)) pairs **OK**
Read command Syntax **AT+CPWC?**	 Response **+CPWC: <curr_class1>,<def_class1>,<band1>[,<curr_class2>,<def_class2>,<band2> [...]]** **OK**

AT+CPWC : Power class	
Write command Syntax **AT+CPWC=[<class> [,<band>]]**	 Response **OK** Parameters **<class>, <curr_classn>, <def_classn>:** 0 default (not applicable to <curr_class>s or <def_classn>s) 1… MS output power class as in GSM 45.005 [38] **<band>, <bandn>:** 0 GSM900 AND GSM850 1 GSM1800 2 GSM1900
Reference [27.007] § 8.29	Notes • Module must be rebooted for the selection to be effective

5.20. *PSRDBS Command: Change Frequency Band

AT*PSRDBS : Change Frequency Band	**HiLoV2 HiAll only**
Test command Syntax **AT*PSRDBS=?**	 Response *** PSRDBS:** (list of supported**<mode>**s), (list of supported **<GSM band>**s) **OK**
Read command Syntax **AT*PSRDBS?**	 Response *** PSRDBS: <GSM band>** **OK**
Write command Syntax ***PSRDBS=<mode>, <GSMband>**	 Response **OK** Parameter **<Mode>:** 0 Set **<Band>** at next switch on (default value) 1 Set **<Band>** immediately by restarting stack **<GSM Band>:** bit field type parameter; to set several bands sum up the values 1 GSM 850 2 GSM 900 4 E-GSM 8 DCS 1800 16 PCS 1900
Reference Sierra Wireless Proprietary	Notes • GSM 900 is included into E-GSM band so the module answers 29 to AT*PSRDBS?

5.21. +CPAS Command: Phone Activity Status

AT+CPAS : Phone activity status	
Test command Syntax **AT+CPAS=?**	 Response **+CPAS:** (list of supported **<pas>**s) **OK**
Execute command Syntax **AT+CPAS**	 Response **+CPAS: <pas>** **OK** Response **<pas>:** 0: ready (ME allows commands from TA/TE) 2: unknown (ME is not guaranteed to respond to instructions) 3: ringing (ME is ready for commands from TA/TE, but the ringer is active) 4: call in progress (ME is ready for commands from TA/TE, but a call is in progress)
Reference [27.007] § 8.1	Notes

5.22. +CSQ Command: Signal Quality

AT+CSQ : Signal quality	
Test command Syntax **AT+CSQ=?**	 Response **+CSQ:** (list of supported **<rssi>**s),(list of supported **<ber>**s) **OK**
Execute command Syntax **AT+CSQ**	 Response **+CSQ: <rssi>,<ber>** **OK** Parameters **<rssi>:** 0: -113 dBm or less 1: -111 dBm 2...30: -109... -53 dBm 31: -51 dBm or greater 99: not known or not detectable **<ber>:** (in percent) 0...7: as RXQUAL values in the table in GSM 05.08 [20] sub clause 8.2.4 99: not known or not detectable
Reference [27.007] § 8.5	Notes

5.23. +KRIC Command: Ring indicator Control

AT+KRIC : Ring indicator control	
Test command Syntax **AT+KRIC=?**	 Response **+KRIC:** (list of supported **<masks>**s),(list of supported **<shape>**s) **OK**
Read command Syntax **AT+KRIC?**	 Response **+KRIC: <masks>,< shape >** **OK**
Write command Syntax **AT+KRIC=<mask> [,<shape>]**	 Response **OK** Parameters **<mask>:** Use of RI signal 0x00: RI not used 0x01: RI activated on incoming calls **(+CRING, RING)** 0x02: RI activated on SMS **(+CMT, +CMTI)** 0x04: RI activated on SMS-CB **(+CBM, +CBMI)** 0x08: RI activated on USSD **(+CUSD)** 0x10: RI activated on network state **(+CIEV)** 0x32: RI activated on FOTA **(+FOTA)** **<shape>:** signal shape – available only for incoming calls 0: Repeat pulses The total length of the pulse is equivalent to the transfer of the RING or CRING notification 1: Always active The signal is set to active during the whole incoming call notification
Reference Sierra Wireless Proprietary	Notes • For a SMS and other unsolicited messages, only one pulse is set • If the 0710 is woken up by an incoming call only one pulse is set, even if shape=0 is used • The width of the pulse is 1s • Setup command only to send once to define the RI behavior • Do not use the command while an incoming call, SMS, SMSCB, USSD…

5.24. +KSREP Command: Mobile Start-up Reporting

AT+KSREP : Mobile start-up reporting	
Test command Syntax **AT+KSREP=?**	 Response **+KSREP:** (list of supported **<act>**s) **OK**
Read command Syntax **AT+KSREP?**	 Response **+KSREP: <act>,<stat>** **OK**
Write command Syntax **AT+KSREP=<act>**	 Response **OK** Parameters **<act>:** Indicates if the module must send a unsolicited code during the startup 0: The module doesn't send an unsolicited code 1: The module will send an unsolicited code **<stat>:** This code indicates the status of the module 0: The module is ready to receive commands for the TE. No access code is required 1: The module is waiting for an access code. (The **AT+CPIN?** Command can be used to determine it) 2: The SIM card is not present 3: The module is in "SIMlock" state 4: unrecoverable error 5: unknown state
Reference Sierra Wireless Proprietary	Notes • The module uses unsolicited code once after the boot process +KSUP: <stat> • The KSUP notification will not be sent if the module is in autobaud mode and no bytes have been received from TE to adapt the serial link to the actual speed

5.25. +KGPIO Command: Hardware IO Control

AT+KGPIO : Hardware IO Control	
Test command Syntax **AT+KGPIO=?**	 Response **+KGPIO:** (list of supported **<IO>**s),(list of supported **<cde>**s) **OK**

AT+KGPIO : Hardware IO Control	
Read command Syntax **AT+KGPIO?**	 Response **OK**
Write command Syntax **AT+KGPIO=<IO>,<cde>**	 Response If <cde> = 2: **+KGPIO: <IO>, <current_value>** **OK** Else **OK** Parameters **<IO>:** Selected IO 1..8: For HiLo V1 1..3: For HiLo V2 1..6: For HiAllNC **<cde>:** 0: Reset the selected IO 1: Set the selected IO 2: Request the current value of the IO

AT+KGPIO : Hardware IO Control	
Reference Sierra Wireless Proprietary	Notes • The current configuration is kept in flash after a reset • Check the configuration of **+KGPIOCFG** when +**CME ERROR: 3** issued • GPIOs may be already used by **+KSIMDET**, **+KJAMDET**, **+KSYNC** **+KTEMPMON**, and **+KGSMAD** • Example: **Make gpio 1 output high/low level** AT+KGPIOCFG=1,0,2 ------Configure GPIO 1 as output mode; <pull mode> **must be** "no pull" OK AT+KGPIO=1, 1 -------Set the selected I/O. OK AT+KGPIO=1, 0 -------Reset the selected I/O. OK **Define input/output mode forgpio1** AT+KGPIOCFG=1,1,0 ------Configure GPIO 1 as input mode;<pull mode> is "pull down" OK AT+KGPIO=1,2 -------Request the current value of this I/O, +KGPIO: 1, 1 -------Value is 1 for GPIO 1. OK

AT+KGPIO : Hardware IO Control	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+KGPIO=?**	 Response **+KGPIO:** (list of supported **<IO>**s),(list of supported **<cde>**s) **OK**
Write command Syntax **AT+KGPIO?**	 Response **OK**

AT+KGPIO : Hardware IO Control	**HiLo3G HiLoNC3GPS**
Write command Syntax **AT+KGPIO=<IO>,<cde>**	Response f <cde> = 2: **+KGPIO: <IO>, <current_value>** **OK** Else **OK** Parameters **<IO>:** Selected IO For HiLo3G 1: GPIO1, pin name of the connector 2: GPIO2, pin name of the connector 3: GPIO3, pin name of the connector For HiLoNC3GPS 1: GPIO2, pin name of the connector 2: GPIO3, pin name of the connector 3: GPIO4, pin name of the connector 4: GPIO5, pin name of the connector 5: GPIO6, pin name of the connector **<cde>:** 0: Reset the selected IO 1: Set the selected IO 2: Request the current value of the IO
Reference Sierra Wireless Proprietary	Notes • The current configuration is **saved in non-volatile memory** before a reset Example **Make gpio 1 output high/low level** AT+KGPIOCFG=1,0,2 ------Configure GPIO1 as output mode;<pull mode>**must be** "no pull" OK AT+KGPIO=1, 1 -------Set the selected I/O OK AT+KGPIO=1, 0 -------Reset the selected I/O OK

AT+KGPIO : Hardware IO Control	HiLo3G HiLoNC3GPS
Reference Sierra Wireless Proprietary	**Define input/output mode forgpio1** AT+KGPIOCFG=1,1,0 ------Configure GPIO1 as input mode;<pull mode> is "pull down" OK AT+KGPIO=1,2 -------Request the current value of this I/O +KGPIO: 1, 1 -------Value is 1 for GPIO1 OK

5.26. +KSLEEP Command: Power Management Control

AT+KSLEEP : Power management control	
Test command Syntax **AT+KSLEEP=?**	 Response **+KSLEEP:** (list of supported **<mngt>**s) **OK**
Read command Syntax **AT+KSLEEP?**	 Response **+KSLEEP: <mngt>** **OK**
Write command Syntax **AT+KSLEEP=<mngt>**	 Response **OK** Parameters **<mngt>:** 0: The module doesn't go in sleep mode as long as DTR is active (low level) DTR has to be active to send AT commands 1: The module decides by itself (internal timing) when it goes in sleep mode 2: The module never goes in sleep mode whatever DTR state is
Reference Sierra Wireless Proprietary	Notes • See appendix SLEEP MODE MANAGEMENT

5.27. +KCELL Command: Cell Environment Information

AT+KCELL : Cell Environment Information	
Test command Syntax **AT+KCELL=?**	 Response **+KCELL:** (list of supported **<revision>**s) **OK**
Read command Syntax **AT+KCELL?**	 Response **OK**
Write command Syntax **AT+KCELL=<revision>**	 Response **+KCELL: <nbcells>** **[,<ARFCN$_i$>,<BSIC$_i$>,<PLMN$_i$>,<LAC$_i$>,<CI$_i$>,<RSSI$_i$>,<TA>]** **[,<ARFCN$_i$>,<BSIC$_i$>,<PLMN$_i$>,<LAC$_i$>,<CI$_i$>,<RSSI$_i$>] […]]** **OK** Parameters **<revision>:** reserved for future development (only 0 for the moment) **<nbcells>:** number of base stations available. The first base station is the serving cell ($0 \leq i \leq 7$) **<ARFCN>:** Absolute Radio Frequency Channel Number in decimal format. **<BSIC>:** Base Station Identify Code in decimal format **<PLMN>:** PLMN identifiers (3 bytes) in hexadecimal format, made of MCC (Mobile Country Code), and MNC (Mobile Network Code) **<LAC>:** Location Area in hexadecimal format **<CI>:** Cell ID, 4 hexadecimal digits, e.g. ABCD **<RSSI>:** Received signal level of the BCCH carrier, decimal value from 0 to 63. The indicated value is an offset which should be added to –110 dBm to get a value in dBm. See the formula specified in TS 05.08 Radio Subsystem Link Control **<TA>:** Timing Advance. 0...63 in decimal format, available only during a communication (equals to 255 at any other time). Only available on serving cell during communication
Reference Sierra Wireless Proprietary	Notes • This command provides information related to the network environment and can be used for example for localization calculation • Values in italic are not available during some times; i.e. during a communication phase CI is not available. By default, all values will be initialized to 0xFF; thus when a value is returned equal to 0xFF, this will mean it was not possible to decode it Example AT+KCELL=0 +KCELL: 5,46,51,64f000,2791,f78,46,1,78,255,ff,ff,2e73,26,60,51,ff,ff,e2f,24,80,60 ,ff,ff,fca,21,16,29,ff,ff,111c,19 OK

5.28. +CRMP Command: Ring Melody Playback

AT+CRMP : Ring melody playback	
Test command Syntax **AT+CRMP=?**	 Response **+CRMP:** (list of supported **<call type>**s),(list of supported **<volume>**s),(**0**),(list of supported **<index>**s) **OK**
Write command Syntax **AT+CRMP=** **<call type>** **[,<volume>[,<type>, <index>]]**	 Response **OK** Parameters **<index>:** integer which defines a ring melody (1-10). **<volume>:** integer which defines the sound level (1-3). The smaller the lower **<call type>:** integer which specifies the type of event which will start the ring. 0: Voice call (default value) **<type>:** 0: ring melody is manufacturer defined (unique supported value)
Reference [27.007] § 8.35	Notes • If a melody is played, it is just played for 10 sec., and then stopped

5.29. *PSVMWN Command: Voice Message Waiting Notification

AT*PSVMWN : Voice mail indicator for unread messages	
Test command Syntax **AT*PSVMWN=?**	 Response ***PSVMWN:** (list of supported **<mode>**) ***PSVMWN:** (list of supported **<mode>**) **OK**
Read command Syntax **AT*PSVMWN?**	 Response ***PSVMWN: < current mode>** **OK**
Write command Syntax **AT*PSVMWN=<mode>**	 Response **OK** Parameters **<Mode>:** 0 Disable presentation of notification 1 enable presentation of notification

AT*PSVMWN : Voice mail indicator for unread messages	
Write command Syntax **AT*PSVMWN=<mode>**	**<line Id >:** 1 (Line 1) 2 (Aux. Line) (for HiLo V1 and V2 only) 3 (data) (for HiLo V1 and V2 only) 4 (fax) (for HiLo V1 and V2 only) **<status>:** 0 (No message waiting) 1 (at least one message is waiting) **<index>:** 0...255,Record index in EF SMS if the received MWI message has been stored in SIM (if it sis a STORE MWI SMS) **<NbMsgWaiting>:** 0...255, Number of message waiting on line <line Id>
Reference Sierra Wireless Proprietary	Notes • Set command enables/disables the presentation of notification result code from ME to TE When <mode> = 1, * PSVMWI: <line Id > , <status> [,<index>[,<NbMsgWaiting>]] (Voice Message Waiting Indication is sent to TE when notification is received from network or at switch on

5.30. +CRSM Command: SIM Restricted Access

AT+CRSM : SIM restricted access	
Test command Syntax **AT+CRSM=?**	 Response **OK**
Write command Syntax **AT+CRSM=<command> [,<fileid>[,<P1>,<P2>,<P3> [,<data>]]]**	 Response **+CRSM: <sw1>,<sw2>[,<response>]** **OK** Parameters **<command>:** command passed on by the MT to the SIM; refer GSM 51.011 [28] 176 READ_BINARY 178 READ_RECORD 192 GET_RESPONSE 214 UPDATE_BINARY 220 UPDATE_RECORD 242 STATUS all other values are reserved **<fileid>:** integer type; this is the identifier of an elementary data file on SIM. Mandatory for every command except STATUS **<Pi>:** integer type; parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET_RESPONSE and STATUS. The values are described in GSM 51.011 [28] **<data>:** information which shall be written to the SIM (hexadecimal character format; refer +CSCS) **<swi>:** integer type; information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command

AT+CRSM : SIM restricted access	
Write command Syntax **AT+CRSM=<command> [,<fileid>[,<P1>,<P2>,<P3> [,<data>]]]**	**<response>:** response of a successful completion of the command previously issued (hexadecimal character format; refer +CSCS). STATUS and GET_RESPONSE return data, which gives information about the current elementary data field. This information includes the type of file and its size (refer GSM 51.011 [28]). After READ_BINARY or READ_RECORD command the requested data will be returned. <response> is not returned after a successful UPDATE_BINARY or UPDATE_RECORD command
Reference [27.007] § 8.18	Notes • For the command READ_BINARY, no transparent file greater than 256 bytes exists. So <P1> parameter is always 0 in SAP. (If <P1>! = 0, AT+CRSM will return ERROR to TE). <P1> is not interesting (error if <P1>>256), <P2> is an offset in the range 0-256, <P3> has a maximum value depending of <P2>. SAP returns always 256 bytes (maximum). If we can use <P2> and <P3>, ATP reads the zones it wants, else ERROR • For the command READ_RECORD, only mode <P2>="04" (absolute) is supported in SAP. (Other modes seem not to be useful) • For the command UPDATE_BINARY, only <P1>="00" and <P2>="00" is possible in SAP. (Same reason as previously: other modes seem not to be useful) • For the command UPDATE_RECORD, as mentioned in the 11.11 recommendation, only PREVIOUS mode (<P2>="03") is allowed for updates on cyclic file. For linear files, SAP only supports mode <P2>="04" (absolute) • For the commands STATUS and GET_RESPONSE, If <FileId> is not given, the command must be done on the last selected file: ATP must memorize <FileId> of the last command (3F00 at the initialization of ATP, by default) Moreover, v_LengthPattern = 0 Example Read EF_{ICCID} (ICC Identification, unique identification number of the SIM): AT+CRSM=176,12258,0,0,10 +CRSM: 144,0,"89330126239181282150" so ICC number is 98331062321918821205

5.31. +KPWM Command: PWM control

AT+KPWM : Pulse Width Modulation (PWM) control	
Test command Syntax **AT+KPWM =?**	Response **+KPWM:** (list of supported **<output>**s),(list of supported **<operation>**s),(list of supported**<period>**s), (list of supported **<dutycycle>)** **OK**
Read command Syntax **AT+KPWM?**	Response **+KPWM: <output>, <operation>, <period>,<dutycycle>** **+KPWM: <output>, <operation>, <period>,<dutycycle>** **OK**

AT+KPWM : Pulse Width Modulation (PWM) control	
Write command Syntax **AT+KPWM=<output>, <operation>,[<period>], [<dutycycle>]**	Response Parameters **<output>:** 0: PWM0 1: PWM1 (for HiLo V1 ONLY) 2: BUZZER **<operation>:** 0: Turn Off 1: Turn On 2: Always High Level **<period>:** 0..126 (when output is PWM): as number of SYSCLK/8 period 0: forces DC PWM output to be high 1..126: DC period is n+1 $T_{SYSCLK/8}$, T = 1 /(26M / 8) = 307 ns Or 0..1023(when output is buzzer): freq = 250000/ (n+1) When period = 249, then freq = 250000 / (249+1) = 1KHz **<dutycycle>:** ranges from 0 to 100 as a percentage
Reference Sierra Wireless Proprietary	Notes • Buzzer does not have “Always High Level” operation • Default value of period and duty-cycle for PWM are 63,50 • Default value of period and duty-cycle for buzzer are 250,100 • New setting of period and duty-cycle will be remembered by Module for future use

5.32. +KGPIOCFG Command: GPIO Configuration

AT+KGPIOCFG : GPIO configuration	
Test command Syntax **AT+KGPIOCFG=?**	Response **+KGPIOCFG:** (list of supported **<n>**s),(list of supported **<dir>**s), (list of supported**<pull mode>**) **OK**
Read command Syntax **AT+KGPIOCFG?**	Response **+KGPIOCFG: <n>,<dir>,< pull mode >[<CR><LF>** **+KGPIOCFG: <n>,<dir>,< pull mode >** **[...]]** **OK**

AT+KGPIOCFG : GPIO configuration	
Write command Syntax **AT+KGPIOCFG =<n>,<dir>,<pull mode>**	 Response **OK** Parameters **<n>:** GPIO number 1..8: For HiLo V1 1..3: For HiLo V2 1..6: For HiAllNC **<dir>:** direction 0 output 1 input **<pull mode>:** 0 pull down: internal pull down resistor available. Only used in input mode 1 pull up: internal pull up resistor available. Only used in input mode 2 no pull: Internal pull up/down resistor NOT available. Only used in output mode
Reference Sierra Wireless Proprietary	Notes • This command provides configuration for **+KGPIO** command • pull down/up mode would provide a stable input level • The current configuration is kept in flash after a reset • See also "Hardware User Guide"

AT+KGPIOCFG : GPIO configuration	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+KGPIOCFG=?**	 Response **+KGPIOCFG:** (list of supported **<n>**s),(list of supported **<dir>**s), (list of supported**<pull mode>)** **OK**
Write command Syntax **AT+KGPIOCFG?**	 Response **+KGPIOCFG: <n>,<dir>,< pull mode >[<CR><LF>** **+KGPIOCFG: <n>,<dir>,< pull mode >** **[...]]** **OK**
Write command Syntax **AT+KGPIOCFG =<n>,<dir>,<pull mode>**	 Response OK Parameters **<n>:** GPIO number For HiLo3G 1: GPIO1, pin name of the connector 2: GPIO2, pin name of the connector 3: GPIO3, pin name of the connector

AT+KGPIOCFG : GPIO configuration	**HiLo3G HiLoNC3GPS**
Write command Syntax **AT+KGPIOCFG =<n>,<dir>,<pull mode>**	For HiLoNC3GPS 1: GPIO2, pin name of the connector 2: GPIO3, pin name of the connector 3: GPIO4, pin name of the connector 4: GPIO5, pin name of the connector 5: GPIO6, pin name of the connector **<dir>:** direction 0: output 1: input **<pull mode>:** 0: pull down: internal pull down resistor available Only used in input mode 1: pull up: internal pull up resistor available Only used in input mode 2: no pull: Internal pull up/down resistor NOT available Only used in output mode
Reference Sierra Wireless Proprietary	Notes • The current configuration is **saved in non-volatile memory** before a reset • This command provides configuration for **+KGPIO** command • The + KGPIOCFG to configure pins to input pull up/down will have few ms to configure as output during the configuration process

5.33. +KADC Command: Analog Digital Converter

AT+KADC : Analog digital converter	**HiLoV2 HiAll only**
Test command Syntax **AT+KADC=?**	Response **+KADC: <list of supported Meas id >, <list of supported Meas time>** **OK**
Read command Syntax **AT+KADC=<Meas id>, <Meas time>**	Response **+KADC: <Meas result>,<Meas id>,<Meas time>, <burst power>** **<Meas id>:** measurement id 0: reserved 2: reserved 3: reserved 4: ADCaux0 5: reserved 6: reserved 7: ADCaux1 (for HiAll NC module only)

AT+KADC : Analog digital converter	**HiLoV2 HiAll only**
Read command Syntax **AT+KADC=<Meas id>, <Meas time>**	**<Meas time>:** measurement time 1: during TX 2: far from TX 3: no constraint **<Meas result>:** measurement result is in µV
Reference Sierra Wireless Proprietary	Notes • 10 bits converter • Only ADCaux0 (id 4) and ADCaux1 are available as external input. Other values are reserved • available range for input (ADCaux0 and ADCaux1 only) is [0; 3] V

5.34. +CSIM Command: Generic SIM Access

AT+CSIM : Generic SIM access	
Test command Syntax **AT+CSIM =?**	Response **OK**
Write command Syntax **AT+CSIM=<length>,<command>**	Response **+CSIM: <length>,<response>** **OK** Parameters **<length>:** integer type; length of the characters that are sent to TE in **<command>** or **<response>** (two times the actual length of the command or response) all other values are reserved **<command>:** command passed on by the ME to the SIM in the format as described in GSM 11.11 [28] (hexadecimal character format; refer +CSCS) **<response>:** response to the command passed on by the SIM to the ME in the format as described in GSM 11.11 [28] (hexadecimal character format; refer +CSCS)
Reference [27.007] § 8.17	Notes • Compared to Restricted SIM Access command +CRSM, the definition of +CSIM allows TE to take more control over the SIM-ME interface. The locking and unlocking of the interface may be done by a special **<command>** value or automatically by TA/ME (by interpreting **<command>** parameter). In case that TE application does not use the unlock command (or does not send a **<command>** causing automatic unlock) in a certain timeout value, ME may release the locking

5.35. +CALM Command: Alert Sound Mode

AT+CALM : Alert sound mode	
Test command Syntax **AT+CALM=?**	 Response **+CALM:** (list of supported **<mode>** s) **OK**
Read command Syntax **AT+CALM?**	 Response **+CALM: <mode >** **OK**
Write command Syntax **AT+CALM=[<mode>]**	 Response **OK** Parameter **<mode> :** 0: normal mode 1: silent mode (all sounds from MT are prevented)
Reference [27.007] § 8.20	Notes • In the case of <mode> =1, all sounds from TA are prevented except the sound of an incoming call (sound of incoming call treated by +CRSL command)

5.36. +CRSL Command: Ringer Sound Level

AT+CRSL : Ringer sound level	
Test command Syntax **AT+CRSL=?**	 Response +**CRSL:** (list of supported **<level>** s) **OK**
Read command Syntax **AT+CRSL?**	 Response **+CRSL: <level>** **OK**
Write command Syntax **AT+CRSL=<level>**	 Response **OK** Parameter **<level> :** 0, 1, 2, 3 integer type value with manufacturer specific range (smallest value represents the lowest sound level)

AT+CRSL : Ringer sound level	
Reference [27.007] § 8.21	Notes • This command is used to select the incoming call ringer sound level of the MT

5.37. +CLAN Command: Language

AT+CLAN : Set language	
Test command Syntax **AT+CLAN=?**	 Response **+CLAN:** (list of supported **<code>** s) **OK**
Read command Syntax **AT+CLAN?**	 Response **+CLAN: <code>** **OK**
Write command Syntax **AT+CLAN=<code>**	 Response **OK** Parameter **<code>** : "auto" ,"en"
Reference [27.007] § 8.30	Notes

5.38. +CSGT Command: Greeting Text

AT+CSGT : Set greeting text	
Test command Syntax **AT+CSGT=?**	 Response **+CSGT:** (list of supported **<mode>** s), **<text>** **OK**
Read command Syntax **AT+CSGT?**	 Response **+CSGT: <text>, <mode>** **OK**

AT+CSGT : Set greeting text	
Write command Syntax **AT+CSGT=<mode> [, <text>]**	 Response **OK** Parameter **<text> :** see **[27.007]** **<mode> :** 0, 1
Reference [27.007] § 8.32	Notes • The mode is not saved, therefore: - setting the mode to 0, even with a text as parameter is equivalent to setting the mode to 1 with an empty string (the greeting text is lost) - the test command returns 1 if and only if the saved text is not empty (in other words +CSGT=1,then +CSGT? returns 0) • This command handles the greeting text in the SIM cards if it exists else the greeting text is handled in EEPROM

5.39. +CSVM Command: Voice Mail Number

AT+CSVM : Set voice mail number	
Test command Syntax **AT+CSVM=?**	 Response **+CSVM:** (list of supported **mode>** s), (list of supported **<type>** s) **OK**
Read command Syntax **AT+CSVM?**	 Response **+CSVM: <mode> , <number> , <type>** **OK**
Write command Syntax **AT+CSVM=<mode> [, <number> [, <type>]]**	 Response **OK** Parameter **<mode> :** 0: Disable the voice mail number. Removes the information about the voice number instead of setting the number as disabled 1 Enable the voice mail number. **<number> :** string type; Character string <0..9,+> **<type> :** default 145 when dialing string includes international access code character "+", otherwise 129
Reference [27.007] § 8.33	Notes • The command type SET allows to modify the existing Voice Mail Number or to create a Voice Mail number if no existing Voice Mail number

5.40. +KGSMAD Command: Antenna Detection

AT+KGSMAD : Antenna detection	**HiLoV2 HiAll only**
Test command Syntax **AT+KGSMAD=?**	 Response **+KGSMAD: <mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO>** **OK**
Read command Syntax **AT+KGSMAD?**	 Response **+KGSMAD: <mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO>** **OK**
Write command Syntax **AT+KGSMAD=<mod>,** **[<urcmode>** **[,<interval>** **[,<detGPIO>** **[,<repGPIO>]]]]**	 Response **OK** Parameters **<mod>:** 0 - Disable antenna detection 1 - Periodic antenna detection 2 - Instantaneous antenna detection **<urcmode>:** URC presentation mode It has meaning only if **<mod>** is 1 0 - Disable the presentation of antenna detection URC 1 - Enable the presentation of antenna detection URC **<interval>** : 45..3600s, the interval between two detection (default is 120) It has meaning only if **<mod>** is 1 **<detGPIO>:** defines which GPIO be used as **input** by Antenna detection algorithm (1 by default) 1..8: For HiLo V1 1..3: For HiLo V2 1..6: For HiAllNC **<repGPIO>:** defines which GPIO be used as **output** by Antenna Detection algorithm to report antenna condition (3 by default) It has meaning only if **<mod>** is 1 1..8: For HiLo V1 1..3: For HiLo V2 1..6: For HiAllNC

AT+KGSMAD : Antenna detection	**HiLoV2 HiAll only**
Reference	Notes • **<repGPIO>** is set to LOW when antenna is connected. Otherwise set to HIGH • If the antenna detection algorithm detects a change in the antenna status the module is notified by URC **+KGSMAD: <presence>** **<presence>:** 0 - antenna connected 1 - antenna connector short circuited to ground 2 - antenna connector short circuited to power 3 - antenna not detected (open) • Check with **+KGPIOCFG** when using **+KGSMAD** command. • GPIOs may be already used by **+KSIMDET**, **+KJAMDET**, **+KSYNC**, and **+KTEMPMON** • Instantaneous activation doesn't affect a periodic activation eventually started before • CME error 23 will be reported, when module start up, because of boot up of file system

5.41. +KMCLASS Command: Change GPRS Multislot Class

AT+KMCLASS : Change GPRS multislot class	
Test command Syntax **AT+KMCLASS=?**	 Response **+KMCLASS:** (list of supported **<class>**s) **OK**
Read command Syntax **AT+KMCLASS?**	 Response **+KMCLASS: <class>** **OK**
Write command Syntax **AT+KMCLASS= <mclass>**	 Response **OK** Parameter **<mclass>:** 1: 1 + 1 2: 2 + 1 4: 3 + 1 8: 4 + 1 10: 4 + 2 12: 4 + 4 (only HiLo3G and HiLoNC3GPS)
Reference Sierra Wireless Proprietary	Notes This command needs a restart in order to be effective

5.42. +KTEMPMON Command: Temperature Monitor

AT+KTEMPMON : Temperature monitor	
Test command Syntax AT+KTEMPMON=?	 Response **+KTEMPMON:** **<mod>,<temperature>,<urcMode>,<action>,<hystTime>,<repGPIO>** **OK**
Read command Syntax **AT+KTEMPMON?**	 Response **+KTEMPMON:** **<mod>,<temperature>,<urcMode>,<action>,<hystTime>,<repGPIO>** **OK**
Write command Syntax **AT+KTEMPMON=** **<mod>,** **[<temperature>** **[,<urcMode>** **[,<action>** **[,<hystTime>** **[,<repGPIO>]]]]]**	 Response **+KTEMPMON: <level>,<value>** **OK** Parameters **<mod>:** 0 - disable the monitor of the module internal temperature 1 - enable the monitor of the module internal temperature **<temperature>:** temperature (0 by default) above it then module will act as **<action>** **<urcMode>:** 0 - it disables the presentation of the temperature monitor URC 1 - it enables the presentation of the temperature monitor URC **<action>:** 0 - no action 1 - automatic shut-down when the temperature is beyond **<temperature>** 2 - The output pin **<repGPIO>** is tied HIGH when **<temperature>** are reached; when the temperature is normal the output pin **<repGPIO>** is tied LOW. If this **<action>** is required, it is mandatory to set the **<repGPIO>** parameter **<hyst_time>:** [0,255] hysteresis time in seconds (30 by default): all the actions happen only if **<temperature>** are maintained at least for this period This parameter is mandatory if **<action>** is not zero **<repGPIO>:** define which GPIO be used as output pin (1 by default) This parameter is mandatory only if **<action>**=2 is required 1..8: For HiLo V1 1..3: For HiLo V2 1..6: For HiAllNC See hardware user's guide for HiLo3G and HiLoNC3GPS

AT+KTEMPMON : Temperature monitor	
Reference	Notes • The module internal temperature reaches either operating or extreme levels; the unsolicited message is in the format: **+KTEMPMEAS: <level>,<value>** where: **<level>** - threshold level -2 - extreme temperature lower bound (see below Note) -1 - operating temperature lower bound (see below Note) 0 - normal temperature 1 - operating temperature upper bound (see below Note) 2 - extreme temperature upper bound (see below Note) **<value>** - actual temperature expressed in Celsius degrees • Typical temperature bounds are represented as following; Extreme Temperature Lower Bound -40°C Operating Temperature Lower Bound -20°C Operating Temperature Upper Bound +55°C Extreme Temperature Upper Bound +85°C • Due to temperature measurement uncertainty there is a tolerance of +/-2°C • Check with **+KGPIOCFG** when using **+KTEMPMON** command • GPIOs may be already used by **+KSIMDET**, **+KJAMDET**, **+KSYNC** and **+KGSMAD** • CME error 23 will be reported, when module start up, because of boot up of file system

5.43. +KSIMDET Command: SIM Detection

AT+KSIMDET : SIM detection	
Test command Syntax **AT+KSIMDET=?**	 Response **+KSIMDET: <mod>,<GPIO>** **OK**
Read command Syntax **AT+KSIMDET?**	 Response **+KSIMDET: <mod>,<GPIO>** **OK**
Write command Syntax **AT+KSIMDET=<mod>, <GPIO>**	 Response **OK** Parameters **<mod>:** 0 - disable the SIM detection. 1 - Enable the SIM detection.

AT+KSIMDET : SIM detection	
Write command Syntax **AT+KSIMDET=<mod>, <GPIO>**	**<GPIO>:** Defines which GPIO be used as **input** by the SIM Detection 1..8: For HiLo V1 1..3: For HiLo V2 1..6: For HiAllNC For HiLo3G 1: GPIO1, pin name of the connector 2: GPIO2, pin name of the connector 3: GPIO3, pin name of the connector For HiLoNC3GPS 1: GPIO2, pin name of the connector 2: GPIO3, pin name of the connector 3: GPIO4, pin name of the connector 4: GPIO5, pin name of the connector 5: GPIO6, pin name of the connector
Reference	Notes • If it detects a change of the SIM status, the module is notified by URC: **+SIM: <status>** where: **<status>** 0 - INSERTED 1 - EXTRACTED • The module makes a reboot after 2s if it detects a change of the SIM status. • GPIO 4 and 5 cannot be used • **<GPIO>** has to be linked to the SIMCD of the SIM card • In order to detect insertion / extraction of the External SIM, one of the GPIOs must be configured in Input Pull UP as follows: AT+KGPIOCFG=x,1,1 where x is GPIO number linked to the SIMCD of the SIM card • GPIOs may be already used by **+KJAMDET**, **+KSYNC**, **+KTEMPMON**, and **+KGSMAD** • CME error 23 will be reported, when module start up, because of boot up of file system

5.44. +KSYNC Command: Application Synchronization Signal

AT+KSYNC : Generate application synchronization signal	
Test command Syntax **AT+KSYNC=?**	Response **+KSYNC:** (list of supported **<mod>**s),(list of supported **<IO>**s),(range of **<Duty Cycle>**),(range of **<Pulse Duration>**) **OK**
Read command Syntax **AT+KSYNC?**	Response **+KSYNC: <mod>,<IO>,<Duty Cycle>,<Pulse Duration>** **OK**

AT+KSYNC : Generate application synchronization signal	
Write command Syntax **AT+KSYNC=<mod>[, <IO> [,<Duty Cycle> [,<Pulse Duration>]]]**	Response **OK** Parameters **<mod>:** 0 - Disable the generation of synchronization signal 1 - Manage the generation of signal according to **<Duty Cycle>** and **<Pulse Duration>**. The waveform of the signal is controlled only by these two parameters; Network status would not affect the waveform 2 - Manage the generation of signal according to network status; **PERMANENTLY OFF** Not register/Initialization/Register denied/no SIM card **600 ms ON / 600ms OFF** Not registered but searching **75 ms ON / 3s OFF** Right connected to the network <Duty Cycle> and <Pulse Duration> are not used in mode 2 **<IO>:** defines which GPIO is used as **output** to indicate the network status 1..8: For HiLo V1 1..3: For HiLo V2 1..6: For HiAllNC 99, defines which PWM is used to output the signal.99: PWM0 **<Duty Cycle>:** integer type; range:1..100; only used in mode 1 **<Pulse Duration>:** integer type; range:1..65535 milliseconds; only used in mode 1
Reference	Notes • The setting of the **<mod>**, **<IO>**, **<Duty Cycle>**, **<Pulse Duration>** was automatically saved in HiLo. • Check with **+KGPIOCFG** when using **+KSYNC** command • GPIOs may be already used by **+KSIMDET**, **+KJAMDET**, **+KTEMPMON**, and **+KGSMAD** • For write command, CME error 23 will be reported, when module start up, because of boot up of file system

AT+KSYNC : Generate application synchronization signal	**HiLo3G**
Test command Syntax **AT+KSYNC=?**	Response **+KSYNC:** (list of supported **<mod>**s),(list of supported **<IO>**s),(range of **<Duty Cycle>**),(range of **<Pulse Duration>**) **OK**
Read command Syntax **AT+KSYNC?**	Response **+KSYNC: <mod>,<IO>,<Duty Cycle>,<Pulse Duration>** **OK**

AT+KSYNC : Generate application synchronization signal	**HiLo3G**
Write command Syntax **AT+KSYNC=<mod>[,<IO>[,<Duty Cycle>[,<Pulse Duration>]]]**	Response **OK** Parameters **<mod>:** 0 - Disable the generation of synchronization signal 1 - Manage the generation of signal according to **<Duty Cycle>** and **<Pulse Duration>**. The waveform of the signal is controlled only by these two parameters; Network status would not affect the waveform 2 - Manage the generation of signal according to network status; **PERMANENTLY OFF** Not register/Initialization/Register denied/no SIM card **600 ms ON / 600ms OFF** Not registered but searching **75 ms ON / 3s OFF** Right connected to the network <Duty Cycle> and <Pulse Duration> are not used in mode 2 **<IO>:** 1 - PWM 1 is used to output the signal **<Duty Cycle>:** Integer type; Range: 1..100; the limitation depends on <Pulse Duration> **<Pulse Duration>:** Integer type: Range 1..8000(ms) **Ex:** If <Pulse Duration> = 8000, then <Duty Cycle> must be equal to 100 (minimum freq. is 0.125Hz) If <Pulse Duration> = 6000, then <Duty Cycle> must be greater than 75 If <Pulse Duration> = 4000, then <Duty Cycle> must great than 50 If <Pulse Duration> = 2000, then <Duty Cycle> must great than 25 If the minimum freq is lower than 0.125Hz, Module will set the frequency to 0.125Hz with <Duty Cycle> =50
Reference	Notes • The setting of the **<mod>**, **<IO>**, **<Duty Cycle>**, **<Pulse Duration>** was automatically saved in HiLo • For write command, CME error 23 will be reported, when module start up, because of boot up of file system

AT+KSYNC :Generate application synchronization signal	**HiLoNC3GPS**
Test command Syntax **AT+KSYNC=?**	Response **+KSYNC:** (list of supported **<mod>**s),(list of supported **<IO>**s),(range of **<Duty Cycle>**),(range of **<Pulse Duration>**) **OK**

AT+KSYNC :Generate application synchronization signal	**HiLoNC3GPS**
Read command Syntax **AT+KSYNC?**	 Response **+KSYNC: <mod>,<IO>,<Duty Cycle>,<Pulse Duration>** **OK**
Write command Syntax **AT+KSYNC=<mod>[,<IO>** **[,<Duty Cycle>** **[,<Pulse Duration>]]]**	 Response **OK** Parameters **<mod>:** 0 - Disable the generation of synchronization signal 1 - Manage the generation of signal according to **<Duty Cycle>** and **<Pulse Duration>**. The waveform of the signal is controlled only by these two parameters; Network status would not affect the waveform 2 - Manage the generation of signal according to network status; **PERMANENTLY OFF** Not register/Initialization/Register denied/no SIM card **750 ms ON / 750 ms OFF** Not registered but searching **75 ms ON / 2.925 s OFF** Right connected to the network <Duty Cycle> and <Pulse Duration> are not used in mode 2 **<IO>:** 1 - PWM 1 is used to output the signal **<Duty Cycle>:** Integer type; Range: 1..100; the limitation depends on <Pulse Duration> **<Pulse Duration>:** Integer type: Range 1..8000(ms) **Ex:** If <Pulse Duration> = 8000, then <Duty Cycle> must be equal to 100 (minimum freq. is 0.125Hz) If <Pulse Duration> = 6000, then <Duty Cycle> must be greater than 75 If <Pulse Duration> = 4000, then <Duty Cycle> must great than 50 If <Pulse Duration> = 2000, then <Duty Cycle> must great than 25 If the minimum freq is lower than 0.125Hz, Module will set the frequency to 0.125Hz with <Duty Cycle> =50
Reference	Notes • The setting of the **<mod>, <IO>, <Duty Cycle>, <Pulse Duration>** was automatically saved in HiLo • For write command, CME error 23 will be reported, when module start up, because of boot up of file system

5.45. +KBND Command: Current GSM Networks Band Indicator

AT+KBND : Current GSM networks band indicator	
Test command Syntax **AT+KBND=?**	 Response **+KBND:** (list of supported <bnd>) **OK**
Read command Syntax **AT+KBND?**	 Response **+KBND: <bnd>** **OK** Parameters **<bnd>:** in Hexadecimal 0x00: Not available 0x01: 850 MHz 0x02: 900 MHz 0x04: 1800 MHz 0x08: 1900 MHz
Reference	Notes • This command returns the GSM band that the HiLo currently uses

AT+KBND : Current GSM networks band indicator	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+KBND=?**	 Response **+KBND:** (list of supported <bnd>) **OK**
Read command Syntax **AT+KBND?**	 Response **+KBND: <bnd>,<channel>** **OK** Parameters **<bnd>**: in Hexadecimal WCDMA: 0x0001:PCS (1900MHz band2) 0x0002:CELL (800MHz band 5) 0x0004: IMT2K (2100MHz band1) 0x0008: 800 MHz 0x0010: 850 MHz 0x0020: 1800MHz 0x0040: 900MHz

AT+KBND : Current GSM networks band indicator	**HiLo3G HiLoNC3GPS**
Read command Syntax **AT+KBND?**	GSM: 0x0200: 850 MHz 0x0400: 900 MHz 0x0800: 1800 MHz 0x1000: 1900 MHz **<channel>**: the channel number in current band
Reference	Notes • This command returns the GSM / WCDMA band that the HiLo currently uses

5.46. +KNETSCAN Command: Network Scan

AT+KNETSCAN : Network scan functionality
Test command Syntax **AT+KNETSCAN=?**	Response **+KNETSCAN:** (list of supported **<mode>**s), (list of supported **<max_cells>**s), (list of supported **<URC>**s), (list of supported **<timeout>**s), (list of supported **<ext>**s) **OK**
Read command Syntax **AT+KNETSCAN?**	Response **+KNETSCAN: <mode>** **OK**
Write command Syntax **AT+KNETSCAN=<mode>[,<oper>[,<max_cells>[,<URC>[,<timeout>[,<ext]]]]]**	Response **OK** when <mode>=2 and command successful **+KNETSCAN: <nbcells>[,<ARFCN>,<BSIC>,<PLMN>,<LAC>,<CI>,<RSSI>,<RAC>[,<ARFCN$_i$>,<BSIC$_i$>,<PLMN$_i$>,<LAC$_i$>,<CI$_i$>,<RSSI$_i$>,<RAC>]]** **OK** Parameters **<mode>:** 0 deactivate network scan 1 activate network scan 2 request cells information **<oper>:** String type, name of the operator in numeric format. If not specify, search on entire band **<PLMN>:** PLMN identifiers (3 bytes), made of MCC (Mobile Country Code), and MNC (Mobile Network Code) **<max_cells>:** [1..33] maximum number of cells of which information will be given (default: 7) **<URC>:** 0 no Unsolicited Result Code sent at the end of the scan 1 Unsolicited Result Code sent at the end of the scan **<timeout>** [1..600] timeout in s for sending Unsolicited Result Code (default: 300)

AT+KNETSCAN : Network scan functionality

Write command

Syntax

AT+KNETSCAN=<mode>[,<oper>[,<max_cells>[,<URC>[,<timeout>[,<ext]]]]]

<ext>: 0 reserved for future purposes

<nbcells>: number of base stations available, (≤ <max_cells>). The first base station is the serving cell

<ARFCN>: Absolute Radio Frequency Channel Number

<BSIC>: Base Station Identify Code

<LAC>: Location Area

<CI>: Cell ID, 4 hexadecimal digits, e.g. ABCD

<RSSI>: Received signal level of the BCCH carrier, decimal value from 0 to 63. The indicated value is an offset which should be added to –110 dBm to get a value in dBm. See the formula specified in TS 05.08 Radio Subsystem Link Control

<RAC>: Routing Area: only for serving cell

Unsolicited Notification

+KNETSCAN: <nbcells>[,<ARFCN>,<BSIC>,<PLMN>,<LAC>,<CI>,<RSSI>,<RAC>[,<ARFCN$_i$>,<BSIC$_i$>,<PLMN$_i$>,<LAC$_i$>,<CI$_i$>,<RSSI$_i$>]]

Reference

Sierra Wireless Proprietary

Notes

- Switch from nominal mode to network scan mode (<mode>=1) makes the HiLo reboot if neither netscan nor cellscan is still active, then HiLo answers OK after reboot. If netscan or cellscan is active, a new scan request doesn't make the HiLo reboot and the answer is immediate
- Switch from network scan mode to nominal mode (<mode>=0) makes the HiLo reboot: HiLo answers OK after reboot
- A value returned equal to 0xFF in the response or the notification, means that it was not possible to decode it
- For parameter <mode>=0 and <mode>=2, no other parameter is needed
- URC is sent when all information are available or when <timeout> expire or when serving cell has changed
- The working band is the one defined by AT*PSRDBS (only for HiLoV2 and HiAll) or KSRAT (for HiLo3G and HiLoNC3GPS)
- Found cells description can be obtained at any moment during scan with an AT command
- A new scan can be requested at any moment, even if the last one is not finished: in that case the HiLo doesn't reboot
- Activation of the scan of a channel stops previous scan of PLMN and inversely

Restrictions

- No normal network activity is possible (call reception, call emission…)
- AT commands related to network are not allowed
- Unsolicited result code are not sent (except the one related to network scan)

Example: Network scan activation

AT+KNETSCAN=1,"20801" OK	Define the PLMN to use in numeric format, the number of cells, the sending of notification, the timeout: reboot
	Module launches a power campaign
+KNETSCAN: 7,567,22,02f810,3802,4f24,29,4,586,26,02f810,3802,4f27,31,571,13,02f810,3802,ae3b,20,8,20,02f810,3802,7c95,21,535,29,02f810,3802,c186,11,24,12,02f810,3802,4f29,12,39,22,02f810,3802,7c96,15	Wait for unsolicited message : +KNETSCAN Power campaign is finished and all information about the serving and neighbors cells has been received

AT+KNETSCAN : Network scan functionality	
Reference Sierra Wireless Proprietary	Retrieving cells information: AT+KNETSCAN=2 — To check cells information at any time +KNETSCAN: 7,567,22,02f810,3802,4f24,29,4,586,26,02f810,3802,4f27,31,571,13,02f810,3802,ae3b,20,8,20,02f810,3802,7c95,21,535,29,02f810,3802,c186,11,24,12,02f810,3802,4f29,12,39,22,02f810,3802,7c96,15 OK Network scan deactivation: AT+KNETSCAN=0 — Return to nominal mode: reboot OK

5.47. +KCELLSCAN Command: Cell Scan

AT+KCELLSCAN : Cell scan functionality	
Test command Syntax **AT+KCELLSCAN=?**	Response **+KCELLSCAN:** (list of supported **<mode>**s), (list of supported **<URC>**s), (list of supported **<timeout>**s), (list of supported **<ext>**s) **OK**
Read command Syntax **AT+KCELLSCAN?**	Response **+KCELLSCAN: <mode>** **OK**
Write command Syntax **AT+KCELLSCAN=<mode>[,<ARFCN>[,<URC>[,<timeout>[,<ext>]]]]]**	Response **OK** when <mode>=2 and command successful **+KCELLSCAN: <ARFCN>,<BSIC>,<PLMN>,<LAC>,<CI>,<RSSI>,<RAC>** **OK** Parameters **<mode>:** 0 deactivate cell scan; 1 activate cell scan; 2 request cell information **<PLMN>:** PLMN identifiers (3 bytes), made of MCC (Mobile Country Code), and MNC (Mobile Network Code). If not specify, search on entire band

AT+KCELLSCAN : Cell scan functionality	
Write command Syntax **AT+KCELLSCAN=<mode>[,<ARFCN>[,<URC>[,<timeout>[,<ext>]]]]]**	**<URC>:** 0 No Unsolicited Result Code sent at the end of the scan 1 Unsolicited Result Code sent at the end of the scan **<timeout>:** [1..120] timeout in s for sending Unsolicited Result Code (default: 60) **<ext>:** 0 reserved for future purposes **<ARFCN>:** Absolute Radio Frequency Channel Number **<BSIC>:** Base Station Identify Code **<LAC>:** Location Area **<CI>:** Cell ID, 4 hexadecimal digits, e.g. ABCD. **<RSSI>:** Received signal level of the BCCH carrier, decimal value from 0 to 63. The indicated value is an offset which should be added to –110 dBm to get a value in dBm. See the formula specified in TS 05.08 Radio Subsystem Link Control **<RAC>:** Routing Area
Unsolicited Notification	**+KCELLSCAN: <ARFCN>,<BSIC>,<PLMN>,<LAC>,<CI>,<RSSI>,<RAC>**
	Notes • Switch from nominal mode to cell scan mode (<mode>=1) makes the HiLo reboot if neither netscan nor cellscan is still active, then HiLo answers OK after reboot. If netscan or cellscan is active, a new scan request doesn't make the HiLo reboot and the answer is immediate • Switch from network scan mode to nominal mode (<mode>=0) makes the HiLo reboot: HiLo answers OK after reboot • A value returned equal to 0xFF in the response or the notification, means that it was not possible to decode it • For parameter <mode>=0 and <mode>=2, no other parameter is needed • For parameter <mode>=1, parameter <ARFCN> is mandatory • URC is sent when all information are available or when <timeout> expired • Found cells description can be obtained at any moment during scan with an AT command • A new scan can be requested at any moment, even if the last one is not finished: in that case the HiLo doesn't reboot • Activation of the scan of PLMN stops previous scan of cell and conversely Restrictions • No normal network activity is possible (call reception, call emission…) • AT commands related to network are not allowed • Unsolicited result code are not sent (except the one related to network scan) Example: Cell scan activation: AT+KCELLSCAN=1,567 — Define the Arfcn, the sending of notification, the timeout: reboot OK — Module launches a power campaign and synchronizes on Arfcn +KCELLSCAN: 567,22,02f810,3802,4f24,29,4 — Wait for unsolicited message : +KCELLSCAN Power campaign is finished and all information about the cell have been received

AT+KCELLSCAN : Cell scan functionality		
	Retrieving cell information: AT+KCELLSCAN=2 +KCELLSCAN: 567,22,02f810,3802,4f24,29,4 OK Cell scan deactivation: AT+KCELLSCAN=0 OK	To check cells information at any time Return to nominal mode: reboot

5.48. +KJAMDET Command: Jamming Detection

AT+KJAMDET : Jamming detection	HiLoV2 HiAll only
Test command Syntax **AT+KJAMDET=?**	Response **+KJAMDET:** (list of supported **<mode>**s),(list of supported **< urc_mode>**s),(list of supported **<gpio_mode>**s),(list of supported **<gpio_index>**s), (list of supported **<rssi_threshold>**s) **OK**
Read command Syntax **AT+KJAMDET?**	Response **+KJAMDET: <mode>,<urc_mode>,<gpio_mode>,<gpio_index>,<rssi_threshold>** **OK**
Write command Syntax **AT+KJAMDET=<mode> [,<urc_mode> [,<gpio_mode> [,<gpio_index> [,<rssi_threshold>]]]]**	Response If **<mode>**=0 and the command is successful **OK** if **<mode>**=1 or 2, **<urc_mode>**=1, and the command is successful **+KJAMDET: <status>** **OK**
Write command Syntax **AT+KJAMDET=<mode> [,<urc_mode> [,<gpio_mode> [,<gpio_index> [,<rssi_threshold>]]]]**	Parameters **<mode>** 0 disable jamming detection (default) 1 detect jamming once 2 detect jamming every 30 seconds **<urc_mode>** 0 Disable the URC presentation for the result of jamming detection 1 Enable the URC presentation for the result of jamming detection **<gpio_mode>** 0 Not report result by GPIO (default) 1 Report result by GPIO. If jamming is detected, the corresponding GPIO will be set to low; if not, it will be set to high

AT+KJAMDET : Jamming detection	**HiLoV2 HiAll only**
Write command Syntax **AT+KJAMDET=<mode>** **[,<urc_mode>** **[,<gpio_mode>** **[,<gpio_index>** **[,<rssi_threshold>]]]]**	**<gpio_index>:** It defines which GPIO will be used as **output** to report the result 1..8: For HiLo V1 (3 by default) 1..3: For HiLo V2 (3 by default) 1..6: For HiAllNC (3 by default) **<rssi_threshold>** It defines the threshold which will be compared with the received signal level Range of values: 1-31 Default value: 20 (The values follow the same definition as in +CSQ. See below) 1 -111 dBm 2...30 -109... -53 dBm / 2 dBm per step 31 -51 dBm or greater **<status>** 0 no jamming detected 1 jamming is detected

Reference	Notes
	• The parameters of this command are stored in the non-volatile memory and will be effective after power cycle
	• Check with **+KGPIOCFG** when using **+KJAMDET** command
	• GPIOs may be already used by **+KSIMDET, +KSYNC, +KTEMPMON, and +KGSMAD**
	
	Examples
	
	AT+KJAMDET=1
	// Detect jamming once; the result will be reported by URC;
	// the RSSI threshold is 20
	
	AT+KJAMDET=1,0,1
	// Detect jamming once; the result will be reported by GPIO 3;
	// the RSSI threshold is 20
	
	AT+KJAMDET=1,0,1,3,15
	// Detect jamming once; the result will be reported by GPIO 3;
	// the RSSI threshold is 15
	
	AT+KJAMDET=2
	// Detect jamming every 30 seconds; the result will be reported by URC;
	// the RSSI threshold is 20
	
	AT+KJAMDET=2,1,1,3
	// Detect jamming every 30 seconds; the result will be reported by URC and GPIO 3;
	// the RSSI threshold is 20
	
	AT+KJAMDET=2,1,1,3,25
	// Detect jamming every 30 seconds; the result will be reported by URC and GPIO 3;
	// the RSSI threshold is 25
	
	AT+KJAMDET=0
	// Disable jamming detection

5.49. +KUART Command: Set UART Bit Mode

AT+KUART : Set number of bits for UART	**HiLoV2 HiAll only**
Test command Syntax **AT+KUART=?**	 Response **+KUART:** (7,8) **OK**
Read command Syntax **AT+KUART?**	 Response **+KUART: <num>** **OK**
Write command Syntax **AT+KUART=<num>**	 Response **OK** Parameters **<num>:** number of bits. It can only be 7 or 8. The default value is 8
Reference Sierra Wireless Proprietary	Notes • After the number of bits for UART is changed, the module must be rebooted for the setting to be effective • When UART is in 7-bit mode: 1. CSD call and SMS can only work with basic ASCII characters (0-127) 2. PPP doesn't work 3. POP3, SMTP, HTTP, TCP, UDP, FTP and KFSFILE will be affected. It is not recommended to use these features in 7-bit mode Examples AT+KUART=7 -> set 7-bit mode; the setting will be effective after reboot AT+KUART=8 -> set 8-bit mode; the setting will be effective after reboot AT+KUART? -> read the number of bits for UART

5.50. +KSAP Command: Remote SIM Access

AT+KSAP : Remote SIM access functionality	**HiLoV2 HiAll only**
Test command Syntax **AT+KSAP=?**	 Response **+KSAP:** (list of supported **<mode>**s) **OK**

AT+KSAP : Remote SIM access functionality	**HiLoV2 HiAll only**
Read command Syntax **AT+KSAP?**	 Response **+KSAP: <mode>** **OK**
Write command Syntax **AT+KSAP=<mode>**	 Response when <mode>=1 **CONNECT** when <mode>=0 **OK** on DCLi which received the command **NO CARRIER** on DLCi dedicated to SAP protocol Parameters **<mode>:** 0 deactivate Remote Sim Access feature 1 activate Remote Sim Access feature
Reference Sierra Wireless Proprietary	Notes • If mux mode is not activated, command is not allowed • Remote Sim Access functionality needs that value of <N1> parameter of AT+CMUX command should at least 276

5.51. +KPLAYSOUND Command: Play Audio File

AT+KPLAYSOUND : Play audio file	**HiLoV2 HiAll only**
Write command Syntax **AT+KPLAYSOUND=<mode>[,<audio_file>][,<volume>][,<duration>]**	 Response **OK** Error case **+CME ERROR: <err>** **+KPLAY_ERROR: <play_notif>** Parameters **<mode>:** integer type 0- Start playing 1- Stop playing **<audio_file>:** string type, indicates the path and midi filename to be played. This is a must when <mode> is 0 **<volume>:** integer which defines the sound level(1-3). The smaller the lower. The default value is 2 **<duration>:** integer type 0- Play the file repetitively. Other value- the whole playing time (in second). The range value is: 1-32767 Default- play the file ONCE **<play_notif>:** integer type. Indicates the cause of the play failure. 1- Cannot play during a call

AT+KPLAYSOUND : Play audio file	**HiLoV2 HiAll only**
Reference Sierra Wireless Proprietary	Notes • Audio file should be stored in "/ftp" • **Only support Sierra Wireless proprietary file format. The max file size is 2048 bytes** • If the HiLo receives a SMS or call, the play will stop • If a melody is already playing, +KPLAYSOUND will stop the current melody and play the new melody • The volume cannot be changed when a melody is playing. +CLVL command has no effect on melody playing • How to build an audio file, please see 13.11
Example	• To add a file: **AT+KFSFILE=0,"/ftp/abc.snd",1024** **CONNECT** The module is ready to receive the file. Once received, the answer is: **OK** • To list the information of directory and file: **AT+KFSFILE=4,"/ftp/"** **+KFSFILE: <F> abc.snd 1024** **+KFSFILE: 1048004 bytes free** **OK** • To play a file: **AT+KPLAYSOUND=0, "abc.snd", 3, 20** ---- play abc.snd file in 3 volume for 20 seconds **OK** • To play a file repetitively: **AT+KPLAYSOUND=0, "abc.snd", 3, 0** ---- play abc.snd file in 3 volume repetitively **OK** • To play a file once: **AT+KPLAYSOUND=0, "abc.snd", 3** ---- play abc.snd file in 3 volume once **OK** • To stop playing immediately: **AT+KPLAYSOUND=1** ---- stop playing **OK**

5.52. +KEFA Command: Deployment Package and Firmware Upgrade

AT+KEFA : Deployment package signature verification and firmware upgrading HiLoV2 HiAll only	
Test command Syntax **AT+KEFA=?**	 Response **+KEFA: (0,1,2,3,4,5)[,(dps file path)]** **OK**
Read command Syntax **AT+KEFA?**	 Response **OK**
Write command Syntax **AT+KEFA=<mode>[,<name>]**	 Response **+KEFA: <status>** **OK** **or** **+KEFA: <KEY ID>** **OK** **or** **+FOTA: 0 (fota procedure is initiating)** **+FOTA: 1 (fota procedure ends successfully)** **+FOTA: 2, <status> (fota procedure failed and <status> is active)**

AT+KEFA : Deployment package signature verification and firmware upgrading only	**HiLoV2 HiAll**
Write command Syntax **AT+KEFA=<mode>[,<name>]**	Parameters **<mode>:** integer type, operation mode 0: Deployment package signature verification only. 1: Deployment package signature verification; then if successfully, upgrades the firmware. 2: Deployment package signature verification; then if successfully, do a reverse upgrade for the firmware 3: Retrieve the public key ID, which was stored in flash memory. 4: Retrieve FDP number 5: Retrieve CIE number **<name>:** string type, Deployment package file path and its name **<status>:** integer type 103: Invalid Dp File 200: Signature verify successfully 202: Invalid Dp File Format 203: Deployment package does not apply to this IMEI 204: Deployment package key ID does not match the public key ID. 205: Target Version Mismatch 206: Verification failed due to corrupted deployment package. 207: Deployment package does not exist or file path is wrong. 208: Verification failed due to corrupted public key 209: FDP numbers mismatch 210: Could not retrieve FDP number 301: Verification failed due to flash memory or file system failure. 302: Failed to update device settings 303: Failed to update firmware >=400: Internal update failure **<KEY ID>:** FOTA key ID
Reference Sierra Wireless Proprietary	Notes • For software delivery without FOTA function, ERROR (or +CME ERROR: 3, +CME ERROR: operation not allowed) will be returned when running +KEFA write command with mode set to 0/1/2/3. Mode 4/5 can be used for software without FOTA • When update finished, dps file would be deleted automatically Reference Sierra Wireless Proprietary • EFA = external firmware over the air agent • DP = deployment package, the binary file that provides the data necessary to initiate firmware update • FOTA key ID = firmware over the air key id, a reference to identify the key used to sign the deployment package. DP signature allows authenticating the source that provides the deployment package. • FDP = a unique identifier that describes the current software status in the module (firmware + customization parameters). • CIE = a unique identifier for the hardware part of the module

AT+KEFA : Deployment package signature verification and firmware upgrading **HiLoV2 HiAll only**	
Reference Sierra Wireless Proprietary	Example There are 4 deployment package files, which was stored in /ftp folder; test1.dps, test2.dps are valid deployment package; test3.dps is an invalid deployment package, test4.dps has a mismatched key ID AT+KFSFILE=4,"/ftp/" +KFSFILE: <F> test4.dps 46015 +KFSFILE: <F> test3.dps 21504 +KFSFILE: <F> test1.dps 46003 +KFSFILE: <F> test2.dps 67153 +KFSFILE: 867018 bytes free OK • Signature verification for test1.dps file, it should be OK AT+KEFA=0,"/ftp/test1.dps" +KEFA: 200 OK • Signature verification for test2.dps, it should fail, because of deployment package has been corrupted AT+KEFA=0,"/ftp/test2.dps" +KEFA: 206 OK • Signature verification for test3.dps, it should fail, because of a wrong key id AT+KEFA=0,"/ftp/test3.dps" +KEFA: 204 OK • Display the stored key id in HiLo AT+KEFA=3 +KEFA: 0000000001 OK • Verify the signature, then upgrades the firmware successfully AT+KEFA=1,"/ftp/test1.dps" +FOTA: 0 +FOTA: 1

5.53. +KBCAP Command: Retrieve Bitmap Capabilities

<table>
<tr><th colspan="2">AT+KBCAP : Retrieve bitmap capabilities</th></tr>
<tr><td>Execute command

Syntax
AT+KBCAP</td><td>Response
+KBCAP: 0xWXYZ (where WXYZ is the Bitmap Capabilities value in Hexa)
FOTA : <status>
ECALL: <status>
GNSS: <status> (Only supported for HiAll)
LTO: <status> (Only supported for HiAll)
JVM: <status> (Only supported for HiAll)
TLS: <status> (Only supported for HiAll)
PARAM : <FDPname>

OK

Parameters
<status>: 0 deactivated
1 activated</td></tr>
<tr><td>Reference
Sierra Wireless Proprietary</td><td>Notes

AT+KBCAP
+KBCAP: 0x0000
FOTA : 0
ECALL : 0
PARAM : 3GPS0001AA

OK

AT+KBCAP

+KBCAP: 0x0002
FOTA: 0
ECALL: 1
GNSS: 0
LTO: 0
JVM: 0
TLS: 0
PARAM: 6939B

OK</td></tr>
</table>

5.54. +KRST Command: Module Reset Period

AT+KRST : Module reset periodically	**HiLoV2 HiAll only**
Test command Syntax **AT+KRST=?**	 Response **+KRST=<0,1,2>[,<time information>,<reset notification>]** **OK**
Read command Syntax **AT+KRST?**	 Response If <type> = 1: **+KRST: 1,<time information>,<reset notification>,<time left>** If <type> = 2: **+KRST=2, <time information>,<reset notification>** If <type> = 0: **+KRST: 0** **OK**
Write command Syntax **AT+KRST =<type>[,<time information>,<reset notification>]**	 Response **OK** Parameters **<type>:** Indicates the type of reset operation 0: Cancel current programmed reset. 1: Program a periodic reset. 2: Program a timely scheduled reset on a daily basis **<time information>:** reset period or a reset time 1-168 hours when <type>=1: module will reset after hours of time; ”HH:MM” when <type>=2: module will reset at this time every day; (HH = hour from 00 to 23, MM = minutes from 00 to 59) **<reset notification>:** enables the display of a reset notification before module restarts. 0: no notification displayed 1: notification display **<time left>:** displays the time left (in minutes) left to reset

AT+KRST : Module reset periodically	**HiLoV2 HiAll only**
Reference Sierra Wireless Proprietary	Notes • When programmable time is come: - For voice call and data call, reset will be delayed until the communication over - For an ongoing AT command, reset will be delayed until the process finished - In other cases, e.g. GPRS connection, SMS services, reset will occur immediately and without URC notification. • The module is notified by URC if reset time is coming: +KRST: RESET, then module will reset in 3 seconds • Programming a new one will take effect immediately: e.g. AT+KRST=0 will cancels any pending programmable reset • Parameters are kept even after start up, it is stored in flash. • It is software reset, not a hardware reset • It' supported in HiLo V2 and Hi-All, not supported in HiLo V1 • Scheduling at a specific time requires the user to setup the device clock correctly using AT+CCLK. AT+KRST won't prevent the user to use scheduled reset with an incorrect date and time setup. It's up to the user to setup its system correctly

5.55. +KPLAYAMR Command: Play AMR File

AT+KPLAYAMR: Play AMR file	**HiLoV2 HiAll HiLoNC3GPS only**
Test command Syntax **AT+ KPLAYAMR=?**	 Response **+KPLAYAMR:** (list of supported **<mode>**s), **<audio_file>**),(list of supported **<volume >**s),(list of supported **<progress>**s) **OK**

AT+KPLAYAMR: Play AMR file	**HiLoV2 HiAll HiLoNC3GPS only**
Write command Syntax **AT+KPLAYAMR=<mode>,[<audio_file>],[<volume>],[progress]**	Response **OK** **+AMR playing : <percent_done>** **+AMR playing : <percent_done> [...]** Error case **+KPLAYAMR_ERROR: <play_notif>** Parameters **<mode>:** integer type 0 Start playing 1 Stop playing 2 Play pause 3 Play resume **<audio_file>:** string type, indicates the path and amr filename to be played. This is a mandatory when <mode> is 0 **<volume>:** integer which defines the sound level(1-10). The smaller the lower. The default value is 5 **<http_notif>:** <progress>: integer type 0 Disable progress display, default value. 1 Enable progress display
Write command Syntax **AT+KPLAYAMR=<mode>,[<audio_file>],[<volume>],[progress]**	**<play_notif>:** integer type. Indicates the cause of the play failure. 1 Unknown error 2 Service not supported 3 Parameters invalid 4 Order incoherent 5 Playback buffer underflow 7 Gaudio init failed 8 Resource blocked 9 Session invalid (Cannot pause or resume the AMR file playing) 10 File not found 11 File read error 12 Memo not exist 13 Param invalid 14 Read out buffer fail 16 Session ID invalid 17 Memory alloc fail 18 File stat error 19 File not opened 20 Null buffer 21 Format file unsupported 22 File seek error **<percent_done>:** integer type. Indicates the percent of the AMR file already played

AT+KPLAYAMR: Play AMR file	**HiLoV2 HiAll HiLoNC3GPS only**
Reference Sierra Wireless Proprietary	Notes • The AMR file can be uploaded by AT+KFSFILE, and it should be stored in "/ftp" • Only narrow-band AMR file format is supported • The max AMR file size depends on the available space of the HiLo flash • The AMR playing will be stopped when making or incoming a call • If KPLAYAMR is started during a voice call, the AMR audio is only heard on MO side (not on MT side). When the AMR file is playing on MO side, the audio for voice call is disabled and nothing is heard on MT side • If an AMR or SND file (+KPLAYSOUND) is already playing, +KPLAYAMR will stop the current playing and play the new one • The volume cannot be changed when an AMR file is playing. +CLVL command has no effect on the AMR file playing • For HiLoNC3GPS supported AMR bit rates are: 6.60, 8.85, 12.65, 14.25, 15.85, 18.25, 19.85, 23.05, 23.85 kbps at a frequency of 8khz

5.56. +KSIMSEL Command: SIM Selection

AT+KSIMSEL : SIM selection	**HiAll NC only**
Test command Syntax **AT+KSIMSEL=?**	 Response **+KSIMSEL: <mode>[,<sim_used>]** **OK**
Read command Syntax **AT+KSIMSEL?**	 Response **+KSIMSEL: <mode>,[<sim_used>]** **OK**
Execute command Syntax **AT+KSIMSEL=<mode>**	 Response **OK** Parameters **<mode>:** SIM selection mode. 0: Force to select External SIM by default. Embedded SIM presence will be ignored 1: Force to select Embedded SIM. External SIM presence will be ignored 2: To select External SIM if present, else Embedded SIM will be set **< sim_used >:** 0: external SIM currently used 1: internal SIM currently used
Reference	Notes • Reboot is needed after setting new mode • Only one SIM is active at a same time(DSSS: Dual SIM Single Standby） • KSIMDET feature is ignored when Embedded SIM is selected • Before using AT+KSIMSEL=2, one of the 6 GPIOs must be configured in Input Pull UP as follows: AT+KGPIOCFG=x,1,1 where x is GPIO number (1-6) • <sim_used> information only available for <mode>=2

5.57. +KSRAT Command: Set Radio Access Technology

AT+KSRAT : Set Radio access technology	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+KSRAT=?**	 Response **+ KSRAT:** (list of supported **<mode>**) **OK**
Read command Syntax **AT+ KSRAT?**	 Response **+KSRAT: <mode>** **OK**
Write command Syntax **AT+KSRAT=<mode>**	 Response **OK** Parameters **<mode>:** 0 auto 1 2G only 2 3G only 3 2G when available, else 3G 4 3G when available, else 2G
	Notes • Module must be rebooted for the selection to be effective

5.58. +KLVSH Command: Extra Power Consumption

AT+KLVSH : Extra power consumption	**HiLo3G only**
Test command Syntax **AT+KLVSH=?**	 Response **+KLVSH:** (list of supported **<mode>**) **OK**
Read command Syntax **AT+KLVSH?**	 Response **+KLVSH: <mode>** **OK**

AT+KLVSH : Extra power consumption	**HiLo3G only**
Write command Syntax **AT+KLVSH=<mode>**	Response **OK** Parameters **<mode>:** 0– no extra power consumption, that is to say when module goes in sleep mode, the internal level shifter is turned off 1– extra power consumption, that is to say the internal level shifter is always on even when module goes in sleep mode
Reference	Notes

	Internal level shifter state		**VGPIO state**		**Extra power consumption**	**Wake up**
	In active mode	**In sleep mode**	**In active mode**	**In sleep mode**		
AT+KLVSH=0	ON	OFF	High	Low	0mA	By sending character to UART
AT+KLVSH=1	ON	ON	High	High	1.3mA	By sending character to UART

- Set parameter's value is saved in flash memory.

5.59. +CTZU Command: Automatic Time Zone Update

AT+CTZU : Automatic time zone update	
Test command Syntax **AT+CTZU=?**	Response **+CTZU:** (list of supported **<onoff>**) **OK**
Read command Syntax **AT+CTZU?**	Response **+CTZU: <onoff >** **OK**

Write command Syntax **AT+CTZU =<onoff>**	 Response **OK** Parameters **<onoff >: integer type** 0 Disable automatic time zone update via NITZ (default) 1 disables automatic time zone update via NITZ
Reference [27.007] §8.40	Notes

5.60. +CTZR Command: Time Zone Reporting

AT+CTZR : Time zone reporting	
Test command Syntax **AT+CTZR=?**	 Response **+CTZR:** (list of supported **<onoff>**) **OK**
Read command Syntax **AT+CTZR?**	 Response **+CTZR: <onoff>** **OK**
Write command Syntax **AT+CTZR =<onoff>**	 Response **OK** Parameters **<onoff>: integer type** 0 Disable time zone change event reporting (default) 1 Enable time zone change event reporting
Reference [27.007] §8.41	Notes • The Time Zone reporting is not affected by the Automatic Time Zone setting command **+CTZU** • If the reporting is enabled the MT returns the unsolicited result code +**CTZV: <tz>** whenever the time zone is changed

5.61. *VOLWEAR Command: Wear Count for Flash Blocks

AT*VOLWEAR : Query Wear Count for Flash Blocks	
Test command Syntax **AT*VOLWEAR=?**	 Response ***VOLWEAR: (0-sysv; 1-app)** **OK**
Read command Syntax **AT*VOLWEAR?**	 Response ***VOLWEAR: <SYSV/APP>: B1=<wear count>** **B2=<wear count>** **B3=<wear count>** **.....** **OK**
Write command Syntax **AT*VOLWEAR =<SYSV/APP>**	 Response **OK** Parameters **<sysv/app>:** integer type 0 folder /SYSV (default) 1 folder /APP.
Reference	Notes • This command is to provide the flash block wear count for volumes SYSV and APP

5.62. +KGSMBOOT Command: GSM Stack Boot Mode

AT+KGSMBOOT : Configure the boot mode of the GSM stack	**HiloV2 HiAll only**
Test command Syntax **AT+KGSMBOOT=?**	 Response **+KGSMBOOT: <boot_mode>** **OK**
Read command Syntax **AT+KGSMBOOT?**	 Response **+KGSMBOOT: <boot_mode>** **OK**

Execute command Syntax **AT+KGSMBOOT=<boot_mode>**	Response **OK** Parameters **<boot_mode>:** 0: Boot with GSM stack OFF 1: Boot with GSM stack ON 2: Boot in the last state (default)
Reference	Notes • To activate the GSM stack, still use AT+CFUN=1,0 • To deactivate the GSM stack, still use AT+CFUN=4,0

6. Network service related Commands

6.1. +CAOC Command: Advice of Charge Information

AT+CAOC : Advice of charge (AoC) information	
Test command Syntax **AT+CAOC=?**	 Response **+CAOC**: (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CAOC?**	 Response **+CAOC: <mode>** **OK**
Write command Syntax **AT+CAOC=[<mode>]**	 Response If <mode> = 0 **+CAOC: <ccm>** **OK** Else **OK**
Execute command Syntax **AT+CAOC**	 Response **+CAOC: <ccm>** **OK** Parameters **<mode>** : 0: query CCM value 1: deactivation of the unsolicited notification (+CCCM) 2: activation of the unsolicited notification **<ccm>**: string type; three bytes of the current CCM value in hexadecimal format
Reference [27.007] §7.16	Notes • The unsolicited code is: **+CCCM: <ccm>** • When activated this message is sent to the TE every time there is a change in the ccm value with a minimum of 10 seconds between 2 messages • This AT command needs SIM and network where AOC are allowed

6.2. +CCFC Command: Call Forwarding Conditions

<table>
<tr><th colspan="2">AT+CCFC : Call forwarding number and conditions control</th></tr>
<tr><td>Test command

Syntax
AT+CCFC=?</td><td>

Response
+CCFC: (list: range of supported <reas>)
OK</td></tr>
<tr><td>Write command

Syntax
AT+CCFC=<reas>,
<mode>[,<number>[,<type>[,<class>[,<subaddr>[,
<satype>[,<time>]]]]]]</td><td>

Response

If <mode> = 2 and command successful:
+CCFC: <status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]]
[+CCFC:
<status>,<class2>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]]]
[…]
OK
Else
OK

Parameter
<reas>: 0: unconditional
1: mobile busy
2: no reply
3: not reachable
4: all call forwarding
5: all conditional call forwarding
<mode>: 0 disable
1 enable
2 query status
3 registration
4: erasure
<number>: string type phone number of forwarding address in format specified by <type>
<type>: type of address octet in integer format
<class>: is a sum of integers each representing a class of information (default 7)
1: voice
2: data
4: fax (for HiLo V1 only)
<subaddr>: string type sub address of format specified by <satype>
<satype>: type of subaddress octet in integer format
<time> 1...30 when "no reply" is enabled, this gives the time i seconds to wait before call is forwarded (default value is 20)
<status>: 0: not active
1: active</td></tr>
<tr><td>Reference
[27.007] § 7.11</td><td>Notes
• This command allows control of the call forwarding supplementary service according to GSM 02.84</td></tr>
</table>

6.3. +CCWA Command: Call Waiting

<table>
<tr><th colspan="2">AT+CCWA : Set call waiting</th></tr>
<tr><td>Test command

Syntax
AT+CCWA=?</td><td>

Response
+CCWA: (list of supported <n>s)
OK</td></tr>
<tr><td>Read command

Syntax
AT+CCWA?</td><td>

Response
+CCWA: <n>
OK</td></tr>
<tr><td>Write command

Syntax
AT+CCWA=[<n> [,<mode>[,<class>]]]</td><td>

Response
when <mode>=2 and command successful
+CCWA: <status>,<class1>
[+CCWA: <status>,<class2>[...]]
OK

Parameters
<n>: sets/shows the result code presentation status in the TA
0 disable
1 enable
<mode>: when <mode> parameter is not given, network is not interrogated
0 disable
1 enable
2 query status
<class>: sum of integers each representing a class of information (default 7):
1 voice (telephony)
2 data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128)
4 fax (facsimile services, for HiLo V1 only)
<status>: 0 not active
1 active
<number>: string type phone number of calling address in format specified by <type>
<type>: type of address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.7)
<alpha>: optional string type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE Character Set +CSCS
<CLI validity>: 0 CLI valid
1 CLI has been withheld by the originator
2 CLI is not available due to interworking problems or limitations of originating network.</td></tr>
<tr><td>Reference
[27.007] § 7.12</td><td>Notes
• When enabled (<n>=1), the following unsolicited code is sent to the TE:
+CCWA: <number>,<type>,<class>[,<alpha>][,<CLI validity>]</td></tr>
</table>

6.4. +CHLD Command: Call Hold and Multiparty

AT+CHLD : Set call hold and multiparty	
Test command Syntax **AT+CHLD=?**	 Response **+CHLD:** (list of supported **<n>**s) **OK**
Execute command Syntax AT+CHLD=[<n>]	 Response **OK** Parameters **<n>:** 0 Terminate all held calls; or set UDUB (User Determined User Busy) for a waiting call, i.e. reject the waiting call. 1 Terminate all active calls (if any) and accept the other call (waiting call or held call) 1X Terminate the active call X (X= 1-7) 2 Place all active calls on hold (if any) and accept the other call (waiting call or held call) as the active call 2X Place all active calls except call X (X= 1-7) on hold 3 Add the held call to the active calls 4 Explicit Call Transfer
Reference [27.007] §7.13	Notes

6.5. +CUSD: Unstructured Supplementary Service Data

AT+CUSD : Unstructured supplementary service data	
Test command Syntax **AT+CUSD=?**	 Response **+CUSD:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CUSD?**	 Response **+CUSD: <n>** **OK**
Unsolicited Notification	**+CUSD: <m>[,<str>,<dcs>]**

AT+CUSD : Unstructured supplementary service data	
Write command Syntax **AT+CUSD=[<n>[,<str>[,<dcs>]]]**	Response **OK** Parameters **<n>:** parameter sets/shows the result code presentation status in the TA 0: disable the result code presentation to the TE (default value if no parameter) 1: enable the result code presentation to the TE 2: cancel session (not applicable to read command response) **<str>:** string type USSD-string (when <str> parameter is not given, network is not interrogated): if <dcs> indicates that 3GPP TS 23.038 [25] 7 bit default alphabet is used: if TE character set other than "HEX" (refer command Select TE Character Set +CSCS): MT/TA converts GSM alphabet into current TE character set according to rules of 3GPP TS 27.005 [24] Annex A if TE character set is "HEX": MT/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number (e.g. character Π (GSM 23) is presented as 17 (IRA 49 and 55)) if <dcs> indicates that 8-bit data coding scheme is used: MT/TA converts each 8-bit octet into two IRA character long hexadecimal numbers (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) **<dcs>:** 3GPP TS 23.038 [25] Cell Broadcast Data Coding Scheme in integer format (default 0) **<m>:** 0 : no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation) 1 : further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation) 2 : USSD terminated by network 3 : other local client has responded 4 : operation not supported 5 : network time out
Reference [27.007] §7.15	Notes • When TE sends an USSD to the network, the OK result code is sent before the response of the network. When network answers, the response will be sent as an URC (as if it was a network initiated operation, in case of error +CUSD: 4 will be sent) • This allows the link not to be blocked for a long time (the network can take a long time to answer a USSD request initiated by the TE) • The USSD session can be aborted using command AT+CUSD=2

6.6. +CLCC Command: List Current Call

AT+CLCC : List current call	
Test command Syntax **AT+CLCC=?**	Response **OK**

AT+CLCC : List current call	
Execute command Syntax **AT+CLCC**	Response **[+CLCC: <id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]]** **[+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]]** **[…]** **OK** Parameters **<id>:** integer type; call identification number as described in GSM 02.30 [19] sub clause 4.5.5.1; this number can be used in +CHLD command operations **<dir>:** 0: mobile originated (MO) call 1: mobile terminated (MT) call **<stat>:** state of the call) 0: active 1: held 2: dialing (MO call) 3: alerting (MO call) 4: incoming (MT call) 5: waiting (MT call) **<mode>:** bearer/teleservice 0: voice 1: data 2: fax (only HiLo V1) 3: voice followed by data, voice mode (only HiLo V1) 4: alternating voice/data, voice mode (only HiLo V1) 5: alternating voice/fax, voice mode (only HiLo V1) 6: voice followed by data, data mode (only HiLo V1) 7: alternating voice/data, data mode (only HiLo V1) 8: alternating voice/fax, fax mode (only HiLo V1) 9: unknown **<mpty>:** 0: call is not one of multiparty (conference) call parties 1: call is one of multiparty (conference) call parties **<number>:** string type phone number in format specified by <type> **<type>:** type of address octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.7) **<alpha>:** string type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE Character Set +CSCS
Reference [27.007] §7.18	Notes • This commands returns the current list of calls of ME • Example: Outgoing voice call in progress **+CLCC: 1,0,0,0,0** • Fax is for HiLo V1 only, not supported in HiLo V2

6.7. +CLCK Command: Facility Lock

AT+CLCK : Facility lock	
Test command Syntax **AT+CLCK=?**	 Response **+CLCK:** (list of supported **<fac>**) **OK**
Execute command Syntax **AT+CLCK=<fac>,<mode>[,<passwd> [,<class>]]**	 Response If **<mode>** <> 2 and command is successful **OK** If **<mode>** = 2 and command is successful **+CLCK:<status>[,<class1>[<CR>,<LF>+CLCK:<status>,class2…]]** **OK** Parameters **<fac>:** values reserved by the present document: "AO" BAOC (Barr All Outgoing Calls) (refer 3GPP TS 22.088 [6] clause 1) "OI" BOIC (Barr Outgoing International Calls) (refer 3GPP TS 22.088 [6] clause 1) "OX" BOIC-exHC (Barr Outgoing International Calls except to Home Country) (refer 3GPP TS 22.088 [6] clause 1) "AI" BAIC (Barr All Incoming Calls) (refer 3GPP TS 22.088 [6] clause 2) "IR" BIC-Roam (Barr Incoming Calls when Roaming outside the home country) (refer 3GPP TS 22.088 [6] clause 2) "AB" All Barring services (refer 3GPP TS 22.030 [19]) (applicable only for mode>=0) "AG" All outgoing barring services (refer 3GPP TS 22.030 [19]) (applicable only for <mode>=0) "AC" All incoming barring services (refer 3GPP TS 22.030 [19]) (applicable only for <mode>=0) "FD" SIM card or active application in the UICC (GSM or USIM) fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>) "SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) "PN" Network Personalization (refer 3GPP TS 22.022 [33]) "PU" network subset Personalization (refer 3GPP TS 22.022 [33]) "PP" service Provider Personalization (refer 3GPP TS 22.022 [33]) **<mode>:** 0 unlock 1 lock 2 query status **<status>:** 0 not active 1 active **<passwd>:** string type; shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD

AT+CLCK : Facility lock	
Execute command Syntax **AT+CLCK=<fac>,<mode> [,<passwd> [,<class>]]**	**<class>:** sum of integers each representing a class of information (default 7): 1 voice (telephony) 2 data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128) 4 fax (facsimile services, for HiLo V1 only) 8 short message service 16 data circuit sync 32 data circuit async
Reference [27.007] §7.4	Notes • This commands may be used by the TE to lock or unlock ME or network facilities (with a password protection) AT+CLCK="PN",2 -->Query the status of the Network Personalization (commonly named "SIMLock", "SIM Lock") +CLCK: 0 --> unlock state OK • For HiLo V2 / HiAll only: In case of unlock ME then re-lock again, a reset of the module is mandatory in order to have the ME locked

6.8. +CLIP Command: Calling Line Identification Presentation

AT+CLIP : Calling line identification presentation	
Test command Syntax **AT+CLIP=?**	Response **+CLIP:** (list of supported **<n>**) **OK**
Read command Syntax **AT+CLIP?**	Response **+CLIP: <n>,<m>** **OK**
Read command Syntax **AT+CLIP=<n>**	Response **OK** Parameters **<n>:** parameter sets/shows the result code presentation status in the TA 0: disable 1: enable **<m>:** parameter shows the subscriber CLIP service status in the network 0: CLIP not provisioned 1: CLIP provisioned 2: unknown (e.g. no network, etc.)

AT+CLIP : Calling line identification presentation	
Read command Syntax **AT+CLIP=<n>**	**<number>:** string type phone number of format specified by <type> **<type>:** type of address octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.7) **<subaddr>:** string type subaddress of format specified by <satype> **<satype>:** type of subaddress octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.8) **<alpha>:** optional string type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE Character Set +CSCS. NOT SUPPORTED. **<CLI validity>:** 0: CLI valid 1: CLI has been withheld by the originator. 2 CLI is not available due to interworking problems or limitations of originating network
Reference [27.007] § 7.6	Notes • When the presentation to the CLI at the TE is enabled, the following notification is sent after every ring notification **+CLIP: <number>,<type>[,<subaddr>,<satype>[,<alpha>,[<CLI validity>]]]**

6.9. +CLIR Command: Calling Line Identification Restriction

AT+CLIR : Calling line identification restriction	
Test command Syntax **AT+CLIR=?**	Response **+CLIR:** (list of supported **<n>**) **OK**
Read command Syntax **AT+CLIR?**	Response **+CLIR: <n>,<m>** **OK**
Execute command Syntax **AT+CLIR=<n>**	Response **OK** Parameters **<n>:** parameter sets the adjustment for outgoing calls 0: presentation indicator is used according to the subscription of the CLIR service 1: CLIR invocation 2: CLIR suppression **<m>:** parameter shows the subscriber CLIR service status in the network 0: CLIR not provisioned 1: CLIR provisioned in permanent mode 2: unknown (e.g. no network, etc.) 3: CLIR temporary mode presentation restricted 4: CLIR temporary mode presentation allowed
Reference [27.007] § 7.7	Notes

6.10. +CNUM Command: Subscriber Number

AT+CNUM : Subscriber number	
Test command Syntax **AT+CNUM=?**	 Response **+CNUM: (0-1),(129,145,161,128-255)** **OK**
Execute command Syntax **AT+CNUM**	 Response **+CNUM: [<alpha1>],<number1>,<type1>[,<speed>,<service>[,<itc>]][<CR><LF>** **+CNUM: [<alpha2>],<number2>,<type2>[,<speed>,<service>[,<itc>]][...]]** **OK** Parameters **<alpha>:** optional alphanumeric string associated with <number>; used character set should be the one selected with command Select TE Character Set +CSCS **<number>:** string type phone number of format specified by <type> **<type>:** type of address octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.7) **<speed>:** as defined in 27.007 sub clause 6.7 or +CBST **<service>:** service related to the phone number 0: asynchronous modem 1: synchronous modem 2: PAD Access (asynchronous) 3: Packet Access (synchronous) 4: voice 5: fax (for HiLo V1 only) also all other values below 128 are reserved by the present document **<itc>:** information transfer capability 0: 3.1kHz 1: UDI
Reference [27.007] § 7.1	Notes • Action command returns the MSISDNs related to the subscriber (this information can be stored in the SIM or in the ME) • The Read Command (AT+CNUM?) returns an error • All the numbers are in the “ON” (Own number) phonebook • Response depends on network providers’ policy Example AT+CNUM +CNUM: "TEL","0612345678",129 +CNUM: "","",255 +CNUM: "","",255 +CNUM: "","",255 OK

6.11. +COLP Command: Connected Line Identification Presentation

AT+COLP : Connected line identification presentation	
Test command Syntax **AT+COLP=?**	 Response **+COLP:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+COLP?**	 Response **+COLP: <n>,<m>** **OK**
Execute command Syntax **AT+COLP=[<n>]**	 Response **OK** Parameters **<n>:** parameter sets/shows the result code presentation status in the TA 0: disable 1: enable **<m>:** parameter shows the subscriber COLP service status in the network 0: COLP not provisioned 1: COLP provisioned 2: unknown (e.g. no network, etc.) **<number>, <type>, <subaddr>, <satype>, <alpha>:** refer +CLIP
Reference [27.007] § 7.8	Notes • This command refers to the GSM supplementary service COLP (Connected Line Identification Presentation) that enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call. • When enabled (and called subscriber allows) >]] the following intermediate result code is returned from TA to TE before any +CR or V.25ter [14] responses +COLP: <number>,<type>[,<subaddr>,<satype> [,<alpha>]] • If COLP=1, the OK answer to an ATD Command happens only after the call is active (and not just after the command)

6.12. +COPN Command: Read Operator Name

AT+COPN : Read operator name	
Test command Syntax **AT+COPN=?**	 Response **OK**
Execute command Syntax **AT+COPN**	 Response **+COPN: <numeric1>,<alpha1>[<CR><LF>** **+COPN: <numeric2>,<alpha2>** **[...]]** **OK** Parameters **<numeric>:** string type; operator in numeric format (see +COPS) **<alpha>:** string type; operator in long alphanumeric format (see +COPS)
Reference [27.007] § 7.21	Notes

6.13. +COPS Command: Operator Selection

AT+COPS : Operator selection	
Test command Syntax **AT+COPS=?**	 Response **+COPS:** [list of supported **(<stat>**,long alphanumeric **<oper>**,short alphanumeric **<oper>**,numeric **<oper>**)s][,,(list of supported **<mode>**s),(list of supported **<format>**s)] **OK**
Read command Syntax **AT+COPS?**	 Response **+COPS: <mode>[,<format>,<oper>]** **OK**
Write command Syntax **AT+COPS=[<mode>[,<format>** **[,<oper>]]]**	 Response **OK** Parameters **<mode>:** 0 automatic (<oper> field is ignored) 1 manual (<oper> field shall be present) 2 unsupported 3 set the read format; use with <format> 4 manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered

AT+COPS : Operator selection	
	<format>: 0 long format alphanumeric <oper> 1 short format alphanumeric <oper> **(HiLo3G only)** 2 numeric <oper> **<oper>:** string type; <format> indicates if the format is alphanumeric or numeric **<stat>:** 0 unknown 1 available 2 current 3 forbidden
Reference [27.007] §7.3	Notes • Only mode 0,1, 3 and 4 are supported

AT+COPS : Operator selection	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+COPS=?**	Response **+COPS:** [list of supported (**<stat>,**long alphanumeric**<oper>**,short alphanumeric**<oper>**,numeric**<oper>[,< AcT>]**)s][,,(list of supported **<mode>**s),(list of supported**<format>**s)] **OK**
Read command Syntax **AT+COPS?**	Response **+COPS: <mode>[,<format>,<oper>[,< AcT>]]** **OK**
Write command Syntax **AT+COPS=[<mode>[,<format> [,<oper>[,< AcT>]]]]**	Response **OK** Parameters **<mode>:** 0 automatic (<oper> field is ignored) 1 manual (<oper> field shall be present, and <AcT> optionally) 3 set the read format; use with <format> 4 manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered **<format>:** 0 long format alphanumeric <oper> 1 short format alphanumeric <oper> 2 numeric <oper> **<oper>:** string type; <format> indicates if the format is alphanumeric or numeric **<stat>:** 0 unknown 1 available 2 current 3 forbidden **<AcT>:** access technology selected: 0 GSM 1 GSM Compact 2 UTRAN
Reference [27.007] §7.3	Notes • Only mode 0,1, 3 and 4 are supported

6.14. +CPOL Command: Preferred PLMN List

AT+CPOL : Preferred PLMN list	
Test command Syntax **AT+CPOL=?**	 Response **+CPOL:** (list of supported **<index>**s),(list of supported **<format>**s) **OK**
Read command Syntax **AT+CPOL?**	 Response **+CPOL: <index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Comp_AcT1>,<UTRAN_AcT1>]** **[+CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Comp_AcT2>,<UTRAN_AcT2>]** **[...]]** **OK**
Write command Syntax **AT+CPOL=[<index>][,<format>[,<oper>[,<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>]]]**	 Response **OK** Parameters **<index>:** integer type; the order number of operator in the SIM/USIM preferred operator list **<format>:** 0 long format alphanumeric <oper> 1 short format alphanumeric <oper> 2 numeric <oper> **<opern>:** string type; <format> indicates if the format is alphanumeric or numeric (see +COPS) **<GSM_AcTn>:** GSM access technology: 0 access technology not selected 1 access technology selected **<GSM_Comp_AcTn>:** GSM compact access technology: 0 access technology not selected 1 access technology selected **<UTRA_AcTn>:** UTRA access technology: 0 access technology not selected 1 access technology selected
Reference [27.007] §7.19	Notes

6.15. +CPWD Command: Change Password

AT+CPWD : Change password	
Test command Syntax **AT+CPWD=?**	 Response **+CPWD:** list of supported (**<fac>,<pwdlength>**)s **OK**
Write command Syntax **AT+CPWD=<fac>, <oldpwd>,<newpwd>**	 Response OK
Write command Syntax **AT+CPWD=<fac>, <oldpwd>,<newpwd>**	Parameters **<fac>:** **"AO"** BAOC (Barr All Outgoing Calls) **"OI"** BOIC (Barr Outgoing International Calls) **"OX"** BOIC-exHC (Barr Outgoing International Calls except to Home Country) **"AI"** BAIC (Barr All Incoming Calls) **"IR"** BIC-Roam (Barr Incoming Calls when Roaming outside the home country) **"AB"** All Barring services (refer GSM02.30[19]) (applicable only for <mode>=0) **"P2"** SIM PIN2**<oldpwd>** password specified for the facility from the user interface or with command. If an old password has not yet been set, **<oldpwd>** is not to enter. **"SC"** SIM (lock SIM card) (SIM asks password in ME power-up and when this lock command issued) **<oldpwd>, <newpwd>:** string type; **<oldpwd>** shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD and **<newpwd>** is the new password; maximum length of password can be determined with **<pwdlength>** **<pwdlength>:** integer type maximum length of the password for the facility
Reference [27.007] §7.5	Notes • Test command returns a list of pairs which present the available facilities and the maximum length of their password • Write command sets a new password for the facility lock function

6.16. +CREG Command: Network Registration

AT+CREG : Network registration	
Test command Syntax **AT+CREG=?**	 Response **+CREG:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CREG?**	 Response **+CREG: <n>,<stat>[,<lac>,<ci>]** **OK**
Execute command Syntax **AT+CREG=<n>**	 Response **OK** Parameters **<n>:** 0: disable network registration unsolicited result code 1: enable network registration unsolicited result code +CREG: <stat> 2: enable network registration and location information unsolicited result code +CREG: <stat>[,<lac>,<ci>]
Execute command Syntax **AT+CREG=<n>**	 **<stat>:** 0: not registered, ME is not currently searching a new operator to register to 1: registered, home network 2: not registered, but ME is currently searching a new operator to register to 3: registration denied 4: unknown 5: registered, roaming **<lac>:** string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) **<ci>:** string type; two byte cell ID in hexadecimal format
Reference [27.007] § 7.2	Notes • Set command controls the presentation of an unsolicited result code **+CREG: <stat>** when <n>=1 and there is a change in the ME network registration status, or code **+CREG: <stat>[,<lac>,<ci>]** when <n>=2 and there is a change of the network cell

6.17. +CSSN Command: Supplementary Service Notification

AT+CSSN : Supplementary service notification	
Test command Syntax **AT+CSSN=?**	 Response **+CSSN:** (list of supported <n>s), (list of supported **<m>**s) **OK**

Read command Syntax **AT+CSSN?**	 Response **+CSSN: <n>,<m>** **OK**
Write command Syntax **AT+CSSN=<n>[,<m>]**	 Response **OK** Parameters **<n>:** 0: Suppresses the +CSSI messages 1: Activates the +CSSI messages **<m>:** 0: Suppresses the +CSSU messages 1: Activates the +CSSU messages
Reference [27.007] § 7.17	Notes Currently, Modules support the following values: • CSSI: 0 to 6 • CSSU: 0 to 5

6.18. +CPLS Command: Select Preferred PLMN list

AT+CPLS : Select preferred PLMN list	
Test command Syntax **AT+CPLS=?**	 Response **+CPLS:** (list of supported **<list>** s) **OK**
Read command Syntax **AT+CPLS?**	 Response **+CPLS: <list>** **OK**
Write command Syntax **AT+CPLS=<list>**	 Response **OK** Parameter **<list> :** 0, 1
Reference [27.007] § 7.20	Notes • This command appears in 27.007 Release 5, but SIM files EFPLMNwAcT, EFOPLMNwAcT exists in Release 99

6.19. +CTFR Command: Call Deflection

AT+CTFR : Call deflection	
Test command Syntax **AT+CTFR=?**	 Response **OK**
Write command Syntax **AT+CTFR=<number> [, <type> [, <subaddr> [, <satype>]]]**	 Response **+CME ERROR: <err>** Parameter **<number> :** string type phone number of format specified by <type> **<type> :** type of address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.7); default 145 when dialing string includes international access code character "+", otherwise 129 **<subaddr> :** string type subaddress of format specified by <satype> **<satype> :** type of subaddress octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.8); default 128
Reference [27.007] § 7.14	Notes

6.20. *PSOPNM Command: Operator Name

AT*PSOPNM : Operator name	**HiLoV2 HiAll only**
Read command Syntax **AT*PSOPNM?**	 Response ***PSOPNM: <Operator Name string>** Parameters **<Operator Name string> :** <String type>: Operator name Character set as specified by command +CSCS
Reference Sierra Wireless Proprietary	• Read command returns operator name string which can be: - The operator name in long format if EFONS SIM file is present and readable in SIM - The operator name short format if EFONS SIM file not present or not readable in SIM - An empty string if neither EFONS nor EFONSF SIM files are present or readable. • Note: ONSF file (Operator Name Short Format) is used for mobile that cannot accommodate to the long name format. • Set command has no effect (OK returned)

6.21. *PSNTRG Command: Network Registration

AT*PSNTRG : Network registration	**HiLoV2 HiAll only**
Test command Syntax **AT*PSNTRG=?**	Select notification mode Response *** PSNTRG: (list of supported <Registration state>s), (list of supported <GPRS state>s), (list of supported <Band indication>s), (list of supported <Rat>s), (list of supported <EGPRS state>s)**
Read command Syntax **AT*PSNTRG?**	Get current network status Response ***PSNTRG: <Registration state>, <GPRS state>, <MCC>, <MNC>, <LAC>, <CI>, <PLMN Name>, [<Band indication>], [<Rat>], [<EGPRS state>]** Parameters **<Registration state> :** 0 Not registered 1 Registered, home PLMN 2 Not registered but searching (registration ongoing) 3 Registration denied 4 Unknown 5 Registered, roaming 6 Limited service (emergency)

AT*PSNTRG : Network registration	**HiLoV2 HiAll only**
Read command Syntax **AT*PSNTRG?**	**<GPRS state> :** 0 No GPRS available on cell 1 GPRS available on cell and MS attached 2 GPRS available on cell but MS not attached 3 GPRS suspended **<MCC> :** <String type>: Mobile country code in numeric format (e.g. “208”) **<MNC> :** <String type>: Mobile network code in numeric format (e.g. “10”) **<LAC> :** <String type>: Two byte location area code in hexadecimal format (e.g. “3FA2”) **<CI> :** <String type>: Two byte cell ID in hexadecimal format (e.g. “6CA5”) **<PLMN Name> :** <String type>: Current PLMN Name in long alphanumeric format **<Band indication> :** 0 GSM 900 1 E-GSM 900 2 DCS 1800 3 DCS 1900 4 GSM 850 **<Rat> :** 0 GSM 1 UMTS **<EGPRS state> :** not supported 0 EGPRS service not available on cell 1 EGPRS service available on cell but MS not GPRS attached 2 EGPRS service available on cell
Write command Syntax **AT*PSNTRG=<mode>**	Select notification mode Response **OK** Parameters **<mode> :** 0 Disable presentation of the notification 1 Enable presentation of the notification

AT*PSNTRG : Network registration	HiLoV2 HiAll only
Reference Sierra Wireless Proprietary	• This command allows access to network registration information • It provides information for both CS and PS domain and is more flexible than +CREG or +CGREG commands. • When <mode> =1, set command enables the presentation of network registration URC (*PSNTRG) every time one of the parameter is updated by network or MS. • Example: AT*PSNTRG? *PSNTRG: 1,1,"208","10","1234","4568","SFR", 0, 0, 0 OK

6.22. *PSHZNT Command: Home Zone Notification

AT*PSHZNT : Home zone notification	HiLoV2 HiAll only
Test command Syntax **AT*PSHZNT=?**	 Response ***PSHZNT: (list of supported <mode>s)**
Read command Syntax **AT*PSHZNT?**	Get current status Response ***PSHZNT: <mode>, <Line 1 zonal indicator>,<Line 1 zonal Label>,<Line 2 zonal indicator>, <Line 2 zonal Label>** Parameters **<mode> :** 0 Disable zonal indication 1 Enable zonal indication **<Line 1 zonal indicator>** 0 Line 1 is not in its home zone 1 Line 1 is in its home zone **<Line 1 zonal label>** <String type> Label Character set as specified by command +CSCS **<Line 2 zonal indicator>** 0 Line 2 is not in its home zone 1 Line 2 is in its home zone **<Line 2 zonal label>** <String type> Label Character set as specified by command +CSCS

AT*PSHZNT : Home zone notification	**HiLoV2 HiAll only**
Write command Syntax **AT*PSHZNT=<mode>**	Set home zone notification mode Response **OK**
Reference Sierra Wireless Proprietary	• Set command is used to enable or disable presentation of home zone zonal indicators (*PSHZ) • Read command returns current < mode> and zonal indicators

6.23. *PSUTTZ Command: Universal Time and Time Zone

AT*PSUTTZ : Universal time and time zone	**HiLoV2 HiAll only**
Test command Syntax **AT*PSUTTZ=?**	Response ***PSUTTZ: (list of supported <mode>s)**
Read command Syntax **AT*PSUTTZ?**	Get current mode Response ***PSUTTZ: <mode>** Parameters **<mode> :** 0 Disable time zone indication 1 Enable time zone indication **<year> :** <Integer type> UT year **<month> :** 1..12 UT month **<day> :** 1..12 UT day **<hour> :** 0..23 UT hour **<minute> :** 0..59 UT minute **<second> :** 0..59 UT second

AT*PSUTTZ : Universal time and time zone	**HiLoV2 HiAll only**
Read command Syntax **AT*PSUTTZ?**	**<timezone> :** <String type> String representing time zone: Range: “-128”...”0”...”+127” **<daylight saving> :** 0..2 Daylight saving
Write command Syntax **AT*PSUTTZ=<mode>**	Set time zone notification mode Response **OK**
Reference Sierra Wireless Proprietary	• Set command is used to enable or disable presentation of universal time and time zone change (*PSUTTZ)

6.24. *PSHPLMN Command: Home PLMN

AT*PSHPLMN : Home PLMN	**HiLoV2 HiAll only**
Read command Syntax **AT*PSHPLMN?**	Get HPLMN information Response ***PSHPLMN: <mcc>, <mnc>, <PLMN name>** Parameters **<MCC> :** <String type> Mobile country code in numeric format (e.g. “208”) **<MNC> :** <String type> Mobile network code in numeric format (e.g. “10”) **<PLMN name id> :** <String type> PLMN name in alphanumeric format
Reference Sierra Wireless Proprietary	• This command is used to get Home PLMN identification (MCC /MNC are decoded from IMSI) • Set command has no effect (returns OK)

6.25. *PSGAAT Command: GPRS Automatic Attach

AT*PSGAAT : GPRS automatic attach	**HiLoV2 HiAll only**
Test command Syntax **AT*PSGAAT=?**	Response ***PSGAAT: (list of supported <attach mode>s)**

AT*PSGAAT : GPRS automatic attach	HiLoV2 HiAll only
Read command Syntax **AT*PSGAAT?**	Get current mode Response ***PSGAAT: <attach mode>** Parameters **<attach mode> :** 0 No GPRS automatic attach at switch on 1 GPRS automatic attach at switch on
Write command Syntax **AT*PSGAAT=<attach mode>**	Set attach mode Response **OK**
Reference Sierra Wireless Proprietary	• Set command is used to select GPRS attach mode at ME switch on

6.26. *PSNWID Command: Network Identity

AT*PSNWID : Network identity	HiLoV2 HiAll only
Test command Syntax **AT*PSNWID=?**	Response ***PSNWID: (list of supported <mode>s)**
Read command Syntax **AT*PSNWID?**	Get current mode Response ***PSNWID: <mode>** Parameters **<attach mode> :** 0 Disable network identity indication 1 Enable network identity indication **<MCC> :** <String type> Mobile country code in numeric format (e.g. “208”) **<MNC> :** <String type> Mobile network code in numeric format (e.g. “10”) **<long name id> :** <String type> Network identity long name Character set as specified by command +CSCS.

AT*PSNWID : Network identity	**HiLoV2 HiAll only**
Read command Syntax **AT*PSNWID?**	**<long name CI> :** 0 Do not add country's initial to network name 1 Add country's initial to network name **<short name id> :** <String type> Network identity short name Character set as specified by command +CSCS. **<short name CI> :** 0 Do not add country's initial to network name 1 Add country's initial to network name
Write command Syntax **AT*PSNWID=<mode>**	Set notification mode Response **OK**
Reference Sierra Wireless Proprietary	• Set command is used to enable or disable presentation of network identity notification (*PSNWID)

6.27. +KNETREJSTAT Command: Network Rejection Status

AT+ KNETREJSTAT : Network rejection status	**HiLoNC3GPS only**
Test command Syntax **AT+KNETREJSTAT =?**	Response **+KNETREJSTAT: (list of supported <mode>) , (list of supported <cause>)**
Read command Syntax **AT+ KNETREJSTAT?**	Response **+KNETREJSTAT: <mode>,<cause>** **OK**
Write command Syntax **AT+ KNETREJSTAT =<mode>**	Response **+KNETREJSTAT: <mode>** **OK** Parameters **<mode>** : <Integer type> 0 Disable network rejection cause unsolicited result code 1 Enable network rejection cause unsolicited result code. Every time the module is disconnected or rejected from the network the notification +KNETREJSTAT: <mode>, <cause> is sent.

AT+ KNETREJSTAT : Network rejection status	**HiLoNC3GPS only**
Write command Syntax **AT+ KNETREJSTAT =<mode>**	**<cause>** : <Integer type> This is the causes defined in 3GPP TS 44.018 in the Table 10.5.2.31.1: RR Cause information element. It is the last stored cause. **0:** Normal event; indicates that the channel is released because of a normal event or that an assignment or handover is successfully, and normally, completed **1:** Abnormal release, unspecified; indicates that the channel is released because of an abnormal event without specifying further reasons **2:** Abnormal release, channel unacceptable; indicates that the channel type or channel characteristics are not acceptable **3:** Abnormal release, timer expired; indicates that the release is caused by a timer expiry **4:** Abnormal release, no activity on the radio path; indicates that some supervisory function has detected that the channel is not active **5:** Pre-emptive release; indicates that the channel is released in order to be allocated to a call with priority (e.g. an emergency call) **6:** UTRAN configuration unknown; indicates that the MS does not know the UTRAN predefined configuration (i.e. was not read from UTRAN Channels) or that the MS does not have the capability to handle the requested default configuration **8:** Handover impossible, timing advance out of range; indicates that a handover is unsuccessful because the target BTS is beyond the normal range and the target BTS would not accept an out of range timing advance **9:** Channel mode unacceptable indicates that the MS does not have the capability to handle the requested mode or type of channel **10:** Frequency not implemented indicates that the MS does not have the capability to operate on (at least one of) the requested frequency(ies) **11:** Originator or talker leaving group call area indicates that VGCS uplink or VBS call is released because the mobile talking is outside the group call area **12:** Lower layer failure indicates that a lower layer failed to establish a connection on the new channel **65:** Call already cleared; indicates that a handover is unsuccessful because the connection has been released by the network or the remote user **95:** Semantically incorrect message; **96:** Invalid mandatory information; **97:** Message type non-existent or not implemented; See annex H, sub-clause H6.2 Cause value = 98 Message type not compatible with protocol state; See annex H, sub-clause H6.3 Cause value = 100 Conditional IE error; See annex H, sub-clause H6.5 Cause value = 101 No cell allocation available; indicates that an assignment or handover is unsuccessful because the MS has no current CA Cause value = 111 Protocol error unspecified; See annex H, sub-clause H6.8

AT+ KNETREJSTAT : Network rejection status	**HiLoNC3GPS only**
Reference Sierra Wireless Proprietary	• <mode> and <cause> are saved in NV memory • <cause> is the last cause stored in the module
Example	• The module is disconnected, check the last cause: +CREG: 1,1 +CGRE: 1,0 AT+KNETREJSTAT? +KNETREJSTAT: 0,3 OK • Active the unsolicited result code notification AT+KNETREJSTAT=1 +KNETREJSTAT:1 OK • If the module is disconnected, the unsolicited result code notification is sent +CREG: 1,1 +CGRE: 1,0 +KNETREJSTAT: 0,8 • Deactivate the unsolicited code result notification AT+KNETREJSTAT=0 +KNETREJSTAT:0 OK

7. Phone book management

7.1. +CPBF Command: Find Phonebook Entries

AT+CPBF : Find phonebook entries	
Test command Syntax **AT+CPBF=?**	 Response **+CPBF: [<nlength>],[<tlength>]** **OK**
Execute command Syntax **AT+CPBF=<findtext>**	 Response **[+CPBF: <index1>,<number>,<type>,<text>]** **[+CBPF: <index2>,<number>,<type>,<text>]** **OK** Parameters **<index1>, <index2>:** integer type values in the range of location numbers of phonebook memory **<number>:** string type phone number of format <type> **<type>:** type of address octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.7) **<findtext>, <text>:** string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS **<nlength>:** integer type value indicating the maximum length of field <number> **<tlength>:** integer type value indicating the maximum length of field <text>
Reference [27.007] §8.13	Notes • Execution command returns phonebook entries (from the current phonebook memory storage selected with +CPBS)

7.2. +CPBR Command: Read Current Phonebook Entries

AT+CPBR : Read current phonebook entries	
Test command Syntax **AT+CPBR=?**	 Response **+CPBR: (list of supported <index>s),[<nlength>],[<tlength>]** **OK**
Execute command Syntax **AT+CPBR=<index1>** **[,<index2>]**	 Response **[+CPBR: <index1>,<number>,<type>,<text>]** **[+CPBR: <index2>,<number>,<type>,<text>]** **OK**

AT+CPBR : Read current phonebook entries	
Execute command Syntax **AT+CPBR=<index1>[,<index2>]**	Parameters **<index1>, <index2>, <index>:** integer type values in the range of location numbers of phonebook memory **<number>:** string type phone number of format <type> **<type>:** type of address octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.7) **<text>:** string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS **<nlength>:** integer type value indicating the maximum length of field <number> **<tlength>:** integer type value indicating the maximum length of field <text>
Reference [27.007] §8.12	Notes • Execution command returns phonebook entries in location number range <index1>... <index2> from the current phonebook memory storage selected with +CPBS

7.3. +CPBS Command: Select Phonebook Memory Storage

AT+CPBS : Select phonebook memory storage	
Test command Syntax **AT+CPBS=?**	Response **+CPBS: (list of supported <storage>s)** **OK**
Read command Syntax **AT+CPBS?**	Response **+CPBS: <storage>[,<used>,<total>]** **OK**
Execute command Syntax **AT+CPBS=<storage>**	Response **OK** Parameters **<storage>:** "DC" ME dialed calls list (+CPBW may not be applicable for this storage) $(AT R97)$ "EN" SIM/USIM (or MT) emergency number (+CPBW is not be applicable for this storage) "FD" SIM fix dialing-phonebook "MC" MT missed (unanswered received) calls list (+CPBW may not be applicable for this storage) "ME" ME storage for phonebook is only supported for HiLo V1. "ON" SIM (or ME) own numbers (MSISDNs) list (reading of this storage may be available through +CNUM also) $(AT R97)$ "RC" MT received calls list (+CPBW may not be applicable for this storage) "SM" SIM phonebook

AT+CPBS : Select phonebook memory storage	
Execute command Syntax **AT+CPBS=<storage>**	**<used>:** integer type value indicating the number of used locations in selected memory **<total>:** integer type value indicating the total number of locations in selected memory
Reference [27.007] §8.11	Notes • Set command selects phonebook memory storage <storage>, which is used by other phonebook commands

7.4. +CPBW Command: Write Phonebook Entries

AT+CPBW : Write phonebook entries	
Test command Syntax **AT+CPBW=?**	Response **+CPBW**: (list of supported **<index>**s),[**<nlength>**], (list of supported **<type>**s),**[<tlength>]** **OK**
Execute command Syntax **AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]**	Response **OK** Parameters **<index>:** integer type values in the range of location numbers of phonebook memory **<number>:** string type phone number of format <type> **<type>:** type of address octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.7) ; default 145 when dialing string includes international access code character "+", otherwise 129 **<text>:** string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS **<nlength>:** integer type value indicating the maximum length of field <number> **<tlength>:** integer type value indicating the maximum length of field <text>
Reference [27.007] §8.14	Notes • Execution command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS

8. SMS AT Commands

8.1. Preliminary comments

The commands supported in both PDU and text modes are only described for PDU mode. For details about text modes, refer to the [27.005].

8.2. Parameters definition

The following parameters are used in the subsequent clauses which describe all commands. The formats of integer and string types referenced here are defined in V.25ter.

The default values are for command parameters, not for result code parameters.

Message Storage Parameters

<index>: integer type; value in the range of location numbers supported by the associated memory

<mem1>: string type; memory from which messages are read and deleted (commands List Messages +CMGL, Read Message +CMGR and Delete Message +CMGD); defined values (others are manufacturer specific):

"BM"	broadcast message storage
"ME"	ME message storage
"MT"	any of the storages associated with ME
"SM"	(U)SIM message storage
"TA"	TA message storage
"SR"	status report storage

<mem2>: string type; memory to which writing and sending operations are made (commands Send Message from Storage +CMSS and Write Message to Memory +CMGW); refer <mem1> for defined values

<mem3>: string type; preferred memory to which received SMs are to be stored (unless forwarded directly to TE; refer command New Message Indications +CNMI); refer <mem1> for defined values; received CBMs are always stored in "BM" (or some manufacturer specific storage) unless directly forwarded to TE; received status reports are always stored in "SR" (or some manufacturer specific storage) unless directly forwarded to TE

<stat>: integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values:

0	"REC UNREAD"	received unread message (i.e. new message)
1	"REC READ"	received read message
2	"STO UNSENT"	stored unsent message (only applicable to SMs)
3	"STO SENT"	stored sent message (only applicable to SMs)
4	"ALL"	all messages (only applicable to +CMGL command)

<total1>: integer type; total number of message locations in <mem1>

<total2>: integer type; total number of message locations in <mem2>

<total3>: integer type; total number of message locations in <mem3>

<used1>: integer type; number of messages currently in <mem1>

<used2>: integer type; number of messages currently in <mem2>

<used3>: integer type; number of messages currently in <mem3>

Message Data Parameters

<ackpdu>: 3G TS 23.040 [3] RP-User-Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without 3G TS 24.011 [6] SC address field and parameter shall be bounded by double quote characters like a normal string type parameter

<alpha>: string type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set +CSCS (see definition of this command in 3G TS 27.007 [9])

<cdata>: 3G TS 23.040 [3] TP-Command-Data in text mode responses; ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

<ct>: 3G TS 23.040 [3] TP-Command-Type in integer format (default 0)

<da>: 3G TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in3G TS 27.007 [9]); type of address given by <toda>

<data>: In the case of SMS: 3G TS 23.040 [3] TP-User-Data in text mode responses; format:

- if <dcs> indicates that 3G TS 23.038 [2] GSM 7 bit default alphabet is used and <fo> indicates that 3G TS 23.040 [3] TP-User-Data-Header-Indication is not set:
- if TE character set other than "HEX" (refer command Select TE Character Set +CSCS in 3G TS 27.007 [9]): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- if TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal number (e.g. character Π (GSM 7 bit default alphabet 23) is presented as 17 (IRA 49 and 55))
- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that 3G TS 23.040 [3] TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

In the case of CBS: 3G TS 23.041 [4] CBM Content of Message in text mode responses; format:

- if <dcs> indicates that 3G TS 23.038 [2] GSM 7 bit default alphabet is used:
- if TE character set other than "HEX" (refer command +CSCS in 3G TS 27.007 [9]): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- if TE character set is "HEX": ME/TA converts each 7-bit character of the GSM 7 bit default alphabet into two IRA character long hexadecimal number
- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number

<dcs>: depending on the command or result code: 3G TS 23.038 [2] SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format

<dt>: 3G TS 23.040 [3] TP-Discharge-Time in time-string format: “yy/MM/dd,hh:mm:ss±zz”, where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to “94/05/06,22:10:00+08”

<fo>:	depending on the command or result code: first octet of 3G TS 23.040 [3] SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format
<length>:	integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> > (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)
<mid>:	3G TS 23.041 [4] CBM Message Identifier in integer format
<mn>:	3G TS 23.040 [3] TP-Message-Number in integer format
<mr>:	3G TS 23.040 [3] TP-Message-Reference in integer format
<oa>:	3G TS 23.040 [3] TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in TS 27.07); type of address given by <tooa>
<page>:	3G TS 23.041 [4] CBM Page Parameter bits 4-7 in integer format
<pages>:	3G TS 23.041 [4] CBM Page Parameter bits 0-3 in integer format
<pdu>:	In the case of SMS: 3G TS 24.011 [6] SC address followed by 3G TS 23.040 [3] TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))
	In the case of CBS: 3G TS 23.041 [4] TPDU in hexadecimal format
<pid>:	3G TS 23.040 [3] TP-Protocol-Identifier in integer format (default 0)
<ra>:	3G TS 23.040 [3] TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3G TS 27.007 [9]); type of address given by <tora>
<sca>:	3G TS 24.011 [6] RP SC address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3G TS 27.007 [9]); type of address given by <tosca>
<scts>:	3G TS 23.040 [3] TP-Service-Centre-Time-Stamp in time-string format (refer <dt>)
<sn>:	3G TS 23.041 [4] CBM Serial Number in integer format
<st>:	3G TS 23.040 [3] TP-Status in integer format
<toda>:	3G TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)
<tooa>:	3G TS 24.011 [6] TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)
<tora>:	3G TS 24.011 [6] TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<tosca>:	3G TS 24.011 [6] RP SC address Type-of-Address octet in integer format (default refer <toda>)
<vp>:	depending on SMS-SUBMIT <fo> setting: 3G TS 23.040 [3] TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>)
<vp>:	depending on SMS-SUBMIT <fo> setting: 3G TS 23.040 [3] TP-Validity-Period either in integer format (default 167), in time-string format (refer <dt>), or if EVPF is supported, in enhanced format (hexadecimal coded string with double quotes)

8.3. +CMGD Command: Delete SMS Message

AT+CMGD : Delete SMS message	
Test command Syntax **AT+CMGD=?**	Response **+CMGD:** (list of supported **<index>**s)[,(list of supported **<delflag>**s)] **OK**
Execute command Syntax **AT+CMGD=<index>[,<delflag>]**	Response **OK** Parameters **<delflag>:** an integer indicating multiple message deletion request as follows: 0 (or omitted) : Delete the message specified in <index> 1: Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched 2: Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched 3: Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched. 4: Delete all messages from preferred message storage including unread messages.
Reference [27.005] §3.5.4	Notes • Execution command deletes message from preferred message storage **<mem1>** location **<index>**. If **<delflag>** is present and not set to 0 then the ME shall ignore **<index>** and follow the rules for **<delflag>** shown before

8.4. +CMGF Command: Select SMS Message Format

AT+CMGF : Select SMS message format	
Test command Syntax **AT+CMGF=?**	Response **+CMGF:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CMGF?**	Response **+CMGF: <mode>** **OK**

AT+CMGF : Select SMS message format	
Execute command Syntax **AT+CMGF=[<mode>]**	 Response **OK** Parameters **<mode>:** 1: text mode
Reference [27.005] §3.2.3	Notes • Set command tells the TA, which input and output format of messages to use. <mode> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages. Mode can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters). Text mode uses the value of parameter <chset> specified by command Select TE Character Set +CSCS to inform the character set to be used in the message body in the TA-TE interface

8.5. +CMGL Command: List SMS Messages from Preferred Storage

AT+CMGL : List SMS messages from preferred storage	
Test command Syntax **AT+CMGL=?**	 Response **+CMGL:** (list of supported **<stat>**s) **OK**
Execute command Syntax **AT+CMGL[=<stat>]**	 Response Only if PDU mode (+CMGF=0) and command successful: **+CMGL:** **<index>,<stat>,[<alpha>],<length><CR><LF><pdu>[<CR><LF>** **+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu>[...]]** **OK** Parameters **<stat>:** • 0, 1, 2, 3, 4 in PDU mode (default: 0) • "REC UNREAD", "REC READ", "STO UNSET", "STO SENT", "ALL" in text mode (default: "REC UNREAD")
Reference [27.005] § 3.4.2 and 4.1	Notes • Execution command returns messages with status value **<stat>** from preferred message storage <mem1> to the TE. Entire data units <pdu> are returned • If status of the message is 'received unread', status in the storage changes to 'received read' • <alpha> is optional, it is NOT used

8.6. +CMGR Command: Read SMS Message

AT+CMGR : Read SMS message	
Write command Syntax **AT+CMGR=<index>**	Response if PDU mode (+CMGF=0) and command successful: **+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu>** **OK**
Reference [27.005] §3.4.3 and 4.2 (+CMGR)	Notes • Execution command returns message with location value <index> from preferred message storage <mem1> to the TE. Status of the message and entire message data unit <pdu> is returned • With AT+CMGR, if status of the message is 'received unread', status in the storage changes to 'received read' • <alpha> is optional, it is NOT used

8.7. +CMGS Command: Send SMS Message

AT+CMGS : Send SMS message	
Test command Syntax **AT+CMGS=?**	Response **OK**
Write command Syntax if PDU mode (+CMGF=0): **AT+CMGS=<length><CR>PDU is given<ctrl-Z/ESC>**	Response if PDU mode (+CMGF=0) and sending successful: **+CMGS: <mr>[,<ackpdu>]** **OK**
Reference [27.005] § 3.5.1 and 4.3	Notes • <length> must indicate the number of octets coded in the TP layer data unit to be given (i.e. SMSC address octets are excluded) • the TA shall send a four character sequence <CR><LF><greater_than><space> (IRA 13, 10, 62, 32) after command line is terminated with <CR>; after that PDU can be given from TE to ME/TA the DCD signal shall be in ACTIVE state while PDU is given the echoing of given characters back from the TA is controlled by V.25ter echo command E • the PDU shall be hexadecimal format (similarly as specified for <pdu>) and given in one line; ME/TA converts this coding into the actual octets of PDU when the length octet of the SMSC address (given in the PDU) equals zero, the SMSC address set with command Service Centre Address +CSCA is used; in this case the SMSC Type-of-Address octet shall not be present in the PDU, i.e. TPDU starts right after SMSC length octet sending can be cancelled by giving <ESC> character (IRA 27) <ctrl-Z> (IRA 26) must be used to indicate the ending of PDU

8.8. +CMGW Command: Write SMS Message to Memory

AT+CMGW : Write SMS message to memory	
Test command Syntax **AT+CMGW=?**	 Response **OK**
Write command Syntax if PDU mode **(+CMGF=0):** **AT+CMGW=<length>[,<stat>]<CR>PDU is given<ctrl-Z/ESC>**	 Response **+CMGW: <index>** **OK**
Reference [27.005] § 3.5.3 and 4.4	Notes • Execution command stores a message to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given. (ME/TA manufacturer may choose to use different default <stat> values for different message types.) The entering of PDU is done similarly as specified in command Send Message +CMGS

8.9. +CMSS Command: Send SMS Message from Storage

AT+CMSS : Send SMS message from storage	
Test command Syntax **AT+CMSS=?**	 Response **OK**
Write command Syntax **AT+CMSS=<index>[,<da>[,<toda>]]**	 Response if PDU mode (+CMGF=0) and sending successful: **+CMSS: <mr>[,<ackpdu>]** **OK**
Reference [27.005] § 3.5.2 and 4.7	Notes • Execution command sends message with location value <index> from message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code • Be careful, all the messages stored in the module may not be forwarded (for instance, carrier messages as SMS replace…)

8.10. +CNMI Command: New SMS Message Indication

AT+CNMI : New SMS message indication	
Test command Syntax **AT+CNMI=?**	 Response **+CNMI:** (list of supported **<mode>**s), (list of supported **<mt>**s), (list of supported **<bm>**s), (list of supported **<ds>**s), (list of supported **<bfr>**s) **OK**
Read command Syntax **AT+CNMI?**	 Response **+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>** **OK**
Write command Syntax **AT+CNMI =[<mode>]** **[,<mt>][,<bm>]** **[,<ds>][,<bfr>]**	 Response OK Parameters **<mode>:** 0: Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. 1: Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE. 2: Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE. **<mt>:** 0: No SMS-DELIVER indications are routed to the TE. 1: If SMS-DELIVER, when a SMS is received there is an unsolicited result code **+CMTI:<memory>,<index>** 2: Class 2 SMS are stored in SM and notification **+CMTI: "SM",<index>** is sent to TE. Other SMS are routed directly to TE and notification sent to TE is **+CMT: [<alpha>],<length><CR><LF><pdu>** (PDU mode enabled) **+CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>** (text mode enabled) **<bm>:** 0 No CBM indications are routed to the TE. 2: New CBMs are routed directly to the TE using unsolicited result code: **CBM: <length><CR><LF><pdu>** (PDU mode enabled) or **+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>** (text mode Enabled). **<ds>:** 0: No SMS-STATUS-REPORTs are routed to the TE. 1: SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: **+CDS: <length><CR><LF><pdu> (PDU mode enabled) or +CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>, <st>** (text mode enabled) **<bfr>:** 0: The buffered notification are sent 1: TA buffer of unsolicited result codes defined within this command is cleared when **<mode> 1...3** is entered
Reference [27.005] § 3.4.1	Notes

8.11. +CSCB Command: Select Cell Broadcast Message

AT+CSCB : Select cell broadcast message	
Test command Syntax **AT+CSCB=?**	 Response **+CSCB:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CSCB?**	 Response **+CSCB: <mode>,<mids>,<dcss>** **OK**
Write command Syntax **AT+CSCB=[<mode>[,<mids>]]**	 Response **OK** Parameters **<mode>:** 0: Accepts messages that are defined in **<mids>** 1: Does not accept messages that are defined in **<mids>** **<mids>:** String type; combinations of CBM message IDs (e.g. "0,1,5,320-478,922"). The number of ranges in **<mids>** parameter string is limited to 6. Intervals not allowed. **<dcss>:** string type; all different possible combinations of CBM data coding schemes (refer <dcs>) (default is empty string); e.g. "0-3,5"
Reference [27.005] § 3.3.4	Notes • Set command selects which types of CBMs are to be received by the ME • The module does not manage SMSCB language, nor the data coding scheme parameter (<dcss> parameter)

8.12. +CSCA Command: SMS Service Center Address

AT+CSCA : SMS service center address	
Test command Syntax **AT+CSCA=?**	 Response **OK**
Read command Syntax **AT+CSCA?**	 Response **+CSCA: <sca>,<tosca>** **OK**

AT+CSCA : SMS service center address	
Write command Syntax **AT+CSCA=<sca> [,<tosca>]**	 Response **OK**
Reference [27.005] § 3.3.1	Notes • Set command updates the SMSC address, through which mobile originated SMS is transmitted. In text mode, the setting is used in the send and write commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero

8.13. +CSMP Command: Set SMS Text Mode Parameters

AT+CSMP : Set SMS text mode parameters	
Test command Syntax **AT+CSMP=?**	 Response **OK**
Read command Syntax **AT+CSMP?**	 Response **+CSMP: <fo>,<vp>,<pid>,<dcs>** **OK**
Write command Syntax **AT+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]**	 Response **OK**
Reference [27.005] § 3.3.2	Notes • Set command is used to select values for additional parameters needed when SM is sent to the network or placed in storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) or define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is given by <fo>. If TA supports the EVPF, see 3G TS 23.040 [3], it shall be given as a hexadecimal coded string (refer e.g. <pdu>) with double quotes. • When storing a SMS-DELIVER from the TE to the preferred memory storage in text mode (refer command Write Message to Memory +CMGW), <vp> field can be used for <scts>. • Example: to activate the SMS-STATUS-REPORT: AT+CSMP=49,167,0,0 OK • Example: to use UCS2 data coding scheme AT+CSMP=17,167,0,8

8.14. +CSMS Command: Select Message Service

AT+CSMS : Select message service	
Test command Syntax **AT+CSMS=?**	 Response **+CSMS:** (list of supported **<service>**s) **OK**
Read command Syntax **AT+CSMS?**	 Response **+CSMS: <service>,<mt>,<mo>,<bm>** **OK**
Write command Syntax **AT+CSMS=<service>**	 Response **+CSMS: <mt>,<mo>,<bm>** **OK** Parameters **<service>:** 0: GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with GSM 27.05 Phase 2 version 4.7.0; Phase 2+ features which do not require new command syntax may be supported, e.g. correct routing of messages with new Phase 2+ data coding schemes) 1: Used only on dual OS platforms i.e. when TE is the only SMS client (SMS are only routed to TA in this case) **<mt>:** Mobile Terminated Messages: 0: Type not supported 1: Type supported **<mo>:** Mobile Originated Messages: 0: Type not supported 1: Type supported **<bm>:** Broadcast Type Messages: 0: Type not supported 1: Type supported
Reference [27.005] §3.2.1	Notes • Set command selects messaging service **<service>**. It returns the types of messages supported by the ME: **<mt>** for mobile terminated messages, **<mo>** for mobile originated messages and **<bm>** for broadcast type messages.

8.15. +CPMS Command: Preferred Message Storage

AT+CPMS : Preferred message storage	
Test command Syntax **AT+CPMS=?**	 Response **+CPMS:** (list of supported **<mem1>**s), (list of supported **<mem2>**s), (list of supported **<mem3>**s) **OK**
Read command Syntax **AT+CPMS?**	 Response **+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>, <total3>** **OK**
Write command Syntax **AT+CPMS=<mem1>[,<mem2>[,<mem3>]]**	 Response **+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>** **OK** Parameters See chapter 8.2

AT+CPMS : Preferred message storage	
Reference [27.005] §3.2.2	Notes • Set command selects memory storages <mem1>,<mem2>,<mem3> to be used for reading, writing, etc. • Configuration is set to default values when the module starts Example AT+CPMS=? +CPMS: ("SM",”ME”),("SM",”ME”),("SM",”ME”) OK AT+CPMS? +CPMS: "SM",27,50,"SM",27,50,"SM",27,50 OK AT+CPMS="SM" +CPMS: 27,50,27,50,27,50 OK AT+CPMS="SM","SM","SM" +CPMS: 27,50,27,50,27,50 OK

SMS classes table VS Preferred Storage:

	Preferred storage SIM		Preferred storage ME	
	Free records	Full	Free records	Full
SMS Class 0 (Immediate display)	1. By default Class 0 is not stored, it is only seen with +CMTI notification 2. A factory parameter can be used to save Class 0 in "SIM", if SIM is full SMS is refused			
SMS Class 1 (ME specific)	SIM	if free space ME else Refused	ME	if free spaces SIM else Refused
SMS Class 2 (SIM specific)	SIM	Refused	SIM	Refused
SMS Class 3 (TE specific)	SIM	Refused	SIM	Refused
SMS No Class	SIM	if free space ME else Refused	ME	if free spaces SIM else Refused

8.16. +CSDH Command: Show Text Mode Parameters

AT+CSDH : Show text mode parameters	
Test command Syntax **AT+CSDH=?**	 Response **+CSDH:** (list of supported **<show>**s) **OK**
Read command Syntax **AT+CSDH?**	 Response **+CSDH: <show>** **OK**
Write command Syntax **AT+CSDH=[<show>]**	 Response **OK** Parameter **<show> :** 0 : do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in +CMT, +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata> 1 : show the values in result codes
Reference [27.005] §3.3.3	Notes • Set command controls whether detailed header information is shown in text mode result codes

8.17. +CSAS Command: Save Settings

AT+CSAS : Save settings	
Test command Syntax **AT+CSAS=?**	 Response **+CSAS:** (list of supported **<profile>**s) **OK**
Write command Syntax **AT+CSAS=[<profile>]**	 Response **OK** Parameter **<profile> :** profile number where user settings are to be stored
Reference [27.005] §3.3.3	Notes • Save the active message service settings (+CSMP) to a nonvolatile memory.

8.18. +CRES Command: Restore Settings

AT+CRES : Restore settings	
Test command Syntax **AT+CRES=?**	Response **+CRES:** (list of supported **<profile>**s) **OK**
Write command Syntax **AT+CRES=[<profile>]**	Response **OK** Parameter **<profile> :** profile number where user settings are stored 0 : values saved by the user 1: default factory settings
Reference [27.005] §3.3.3	Notes • Restore the saved message service settings (+CSMP) from a nonvolatile memory

8.19. +CMT Notification: Received SMSPP Content

+CMT : Received SMSPP content	
Unsolicited notification	Response **+CMT: [<alpha>], <length><CR><LF><pdu>** **+CMT: <oa> ,[<alpha>], <scts> [, <tooa> , <fo>, <pid> , <dcs> , <sca> , <tosca> , <length>] <CR > <LF> <data>**
Reference [27.005]	Notes • All parameters are extracted from received message • Detailed header information is shown in text mode result codes according to command Show Text Mode Parameters +CSDH

8.20. *PSMEMCAP Command: SMS Memory Capacity

AT*PSMEMCAP : SMS memory capacity	**HiLoV2 HiAll only**
Test command Syntax **AT*PSMEMCAP=?**	Response ***PSMEMCAP: (list of supported <TE memory status>), (list of supported <mode>)**

AT*PSMEMCAP : SMS memory capacity	**HiLoV2 HiAll only**
Read command Syntax **AT*PSMEMCAP?**	Get current status Response ***PSMEMCAP: <mode>, <TE memory status> , <SIM memory free records>** Parameters **<mode> :** 0 Disable notification presentation 1 Enable notification presentation **<TE memory status> :** 0 TE memory available for SMS storage 1 TE memory capacity exceeded **<SIM memory free records>:** 0 SIM is full 1..255 Number of free SMS records
Write command Syntax **AT*PSMEMCAP** **=<TE memory status>** **[,<mode>]**	Response ***PSMEMCAP: <SIM memory status>, <Network status>** Parameters **<SIM memory status> :** 0 SIM memory available for SMS storage 1 SIM memory capacity exceeded **<Network status> :** 0 No notification sent to network 1 "Memory available" has been sent to network after last SMS operation 2 "Memory capacity exceeded" has been sent to network after last SMS operation
Reference Sierra Wireless Proprietary	• This command allows SMS memory status synchronization between ME (SIM) and TE. It allows suspend/resume SMS reception depending on SIM and TE memory status availability for SMS storage • Set command is used to inform ME about SMS memory status on TE side • Set command is also used to control presentation memory notification when SIM memory status changes (full/available) or when network has been informed of "memory capacity exceeded" or "memory available"

9. Data and FAX AT Commands

9.1. +CBST Command: Select Bearer Service Type

AT+CBST : Select bearer service type	
Test command Syntax **AT+CBST=?**	Response **+CBST:** (list of supported **<speed>**s),(list of supported **<name>**s),(list of supported **<ce>**s) **OK**
Read command Syntax **AT+CBST?**	Response **+CBST: <speed>,<name>,<ce>** **OK**
Write command Syntax **AT+CBST=[<speed>[,<name>[,<ce>]]]**	Response **OK** Parameter **<speed>:** 0 autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service) 7 9600 bps (V.32) 71 9600 bps (V.110 or X.31 flag stuffing) **<name>:** 0 data circuit asynchronous (UDI or 3.1 kHz modem) **<ce>:** 1 non-transparent
Reference [27.007] §6.7	Note • Set command selects the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls are originated (refer 3G TS 22.002 [1]). Values may also be used during mobile terminated data call setup, especially in case of single numbering scheme calls

AT+CBST : Select bearer service type	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+CBST=?**	Response **+CBST:** (list of supported**<speed>**s),(list of supported **<name>**s),(list of supported**<ce>**s) **OK**
Read command Syntax **AT+CBST?**	Response **+CBST: <speed>,<name>,<ce>** **OK**

AT+CBST : Select bearer service type	**HiLo3G HiLoNC3GPS**
Write command Syntax **AT+CBST=[<speed>[,<name>[,<ce>]]]**	Response **OK** Parameter **<speed>:** 0 autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service) 7 9600 bps (V.32) 12 9600 bps (V.34) 14 14400 bps (V3.4) 16 28800 bps (V3.4) 17 33600 bps (V3.4) 39 9600 bps (V.120) 43 14400 bps (V.120) 48 28800 bps (V.120) 51 48000 bps (V.120) 71 9600 bps (V.110 or X.31 flag stuffing) 75 14400 bps (V.110) 80 28800 bps (V.110) 81 38400 bps (V.110) 83 56000 bps (X.31 flag stuffing, UDI) 116 64000 bps 13 64000 bps (multimedia) **<name>:** 0 data circuit asynchronous (UDI or 3.1 kHz modem) 1 data circuit synchronous (UDI or 3.1 kHz modem) 4 data circuit asynchronous (RDI) **<ce>:** 0 transparent 1 non-transparent
Reference [27.007] §6.7	Note • Set command selects the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls are originated (refer 3G TS 22.002 [1]). Values may also be used during mobile terminated data call setup, especially in case of single numbering scheme calls

9.2. +CRLP Command: Select Radio Link Protocol Parameter

AT+CRLP : Select radio link protocol parameter
Test command Syntax **AT+CRLP=?**	Response **+CRLP:** (list of supported **<iws>**s),(list of supported **<mws>**s),(list of supported **<T1>**s),(list of supported **<N2>**s)[,**<ver1>**[,(list of supported **<T4>**s)]] **[+CRLP:** (list of supported **<iws>**s),(list of supported **<mws>**s),(list of supported **<T1>**s),(list of supported **<N2>**s)[,**<ver1>**[,(list of supported **<T4>**s)]][...]] **OK**

AT+CRLP : Select radio link protocol parameter	
Read command Syntax **AT+CRLP?**	Response **+CRLP: <iws>,<mws>,<T1>,<N2>[,<ver1>[,<T4>]]** **[+CRLP: <iws>,<mws>,<T1>,<N2>[,<ver2>[,<T4>]]** **[...]]** **OK**
Write command Syntax **AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>[,<ver>[,<T4>]]]]]]**	Response **OK** Parameters **<ver>, <verx>:** RLP version number in integer format; when version indication is not present it shall equal 0 **<iws>, <mws>, <T1>, <N2>, <T4>:** IWF to MS window size, MS to IWF window size, acknowledgement timer T1, retransmission attempts N2, re-sequencing period T4 in integer format (default values and value ranges depend on RLP version; refer 3G TS 24.022 [18]): T1 and T4 are in units of 10 ms
Reference [27.007] §6.8	Notes • Radio link protocol (RLP) parameters used when non-transparent data calls are originated may be altered with set command. Available command subparameters depend on the RLP versions implemented by the device (e.g. <ver> may not be available if device supports only versions 0 and 1) • If radio link protocol is not used, but some other error correcting protocol (for transparent data calls), V.25ter [14] Error Control Selection test command +ES=? may be used to indicate the presence of the protocol • Read command returns current settings for each supported RLP version <verx>. Only RLP parameters applicable to the corresponding <verx> are returned • Test command returns values supported by the TA as a compound value. If ME/TA supports several RLP versions <verx>, the RLP parameter value ranges for each <verx> are returned in a separate line • Versions 0 and 1 share the same parameter set. Read and test commands shall return only one line for this set (where <verx> is not present)

9.3. +CR Command: Service Reporting Control

AT+CR : Service reporting control	
Test command Syntax **AT+CR=?**	Response **+CR:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+CR?**	Response **+CR: <mode>** **OK**

AT+CR : Service reporting control	
Write command Syntax **AT+CR=[<mode>]**	Response **OK** Parameters **<mode>:** 0: disables reporting 1: enables reporting **<serv>:** ASYNC: asynchronous transparent SYNC: synchronous transparent REL ASYNC: asynchronous non-transparent REL SYNC: synchronous non-transparent GPRS [<L2P>] GPRS The optional <L2P> proposes a layer 2 protocol to use between the MT and the TE. It is defined in the Enter GPRS Data Mode command.
Reference [27.007] §6.9	Notes • Set command controls whether or not intermediate result code +CR: <serv> is returned from the TA to the TE. If enabled, the intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before the intermediate result code CONNECT is transmitted • This command replaces V.25ter [14] command Modulation Reporting Control +MR, which is not appropriate for use in the GSM/UMTS network. Possible error control (other than radio link protocol) and data compression reporting can be enabled with V.25ter commands Error Control Reporting +ER and Data Compression Reporting +DR

9.4. +FCLASS Command: Fax: Select, Read or Test Service Class

AT+FCLASS Fax : Select, read or test service class	**HiLoV1 only**
Test command Syntax **AT+FCLASS=?**	Response (list of supported **<n>**s) **OK**
Read command Syntax **AT+FCLASS?**	Response **<n>** **OK**
Write command Syntax **AT+FCLASS=<n>**	Response **OK** Parameters **<n>:** 0: Select Data mode (default) 1: Select Facsimile Class 1, for HiLo V1 only

AT+FCLASS Fax : Select, read or test service class	HiLoV1 only
Reference [27.007] § C.2.1	Notes

9.5. +FRM Command: Receive Data

AT+FRM : Receive data	HiLo V1 only
Test command Syntax **AT+FRM=?**	 Response (List of supported **<mode>**s) **OK**
Read command Syntax **AT+FRM?**	 Response **+FRM:<mode>** **OK**
Write command Syntax **AT+FRM=<mode>**	 Response **CONNECT** Or **NO CARRIER** Parameters **<mode>:** Modulation used by the other modem to transmit data. The mobile phone should then enter in a receiving mode, using that modulation 24: V27 ter 2400 bps 48: V27 ter 4800 bps 72: V29 7200 bps 96: V29 9600 bps
Reference	Notes • This command is fully supported only in fax mode (AT+FCLASS=1) • Set command only supported during FAX communication established. Read and test command only supported in command mode • Read command always return 9600 bits/s because the communication must begin at this speed

9.6. +FTM Command: Transmit Data

AT+FTM : Transmit data	HiLo V1 only
Test command Syntax **AT+FTM=?**	 Response (List of supported **< mode >**s) **OK**

AT+FTM : Transmit data	HiLo V1 only
Read command Syntax **AT+FTM?**	 Response **+FTM:<mode>** **OK**
Write command Syntax **AT+FTM=< mode >**	 Response **CONNECT** Or **NO CARRIER** Parameters **< mode >:** Modulation used by the other modem to transmit data. The mobile phone should then enter in a receiving mode, using that modulation. 24: V27 ter 2400 bps 48: V27 ter 4800 bps 72: V29 7200 bps 96: V29 9600 bps
Reference TIA578A	Notes • This command is fully supported only in fax mode (AT+FCLASS=1). • Set command only supported during FAX communication established. Read and test command only supported in command mode. • Read command always return 9600 bits/s because the communication must begin at this speed

9.7. +FRS Command: Receive Silence

AT+FRS : Receive silence	HiLo V1 only
Test command Syntax **AT+FRS=?**	 Response **OK**
Read command Syntax **AT+FRS?**	 Response **ERROR**
Write command Syntax **AT+FRS=<n>**	 Response **OK** Parameters **<n>:** number of times of 10 ms of silence detected on the line to be waited for by the modem before it can report OK to DTE (0-255)
Reference TIA578A	Notes • Only supported during FAX communication established

9.8. +FTS Command: Stop Transmission and Wait

AT+FTS : Stop transmission and wait	**HiLo V1 only**
Test command Syntax **AT+FTS=?**	 Response **OK**
Read command Syntax **AT+FTS?**	 Response **ERROR**
Write command Syntax **AT+FTS=**< mode >	 Response **OK** Parameters **< mode >:** number of times of 10 ms of silence detected on the line to be waited for by the modem before it can report OK to DTE (0-255)
Reference	Notes • Only supported during FAX communication established

9.9. +FRH Command: Receive Data using HDLC Framing

AT+FRH : Receive data using HDLC framing	**HiLo V1 only**
Test command Syntax **AT+FRH=?**	 Response (list of supported **< mode >**s) **OK**
Read command Syntax **AT+FRH?**	 Response **+FRH:<mode>** **OK**
Write command Syntax **AT+FRH=< mode >**	 Response **OK** Parameters **< mode >:** modulation used by the other modem to transmit data, using HDLC protocol. 3: V21 channel 2 300 bps
Reference TIA578A	Notes • This command is fully supported only in fax mode (AT+FCLASS=1) • Set command only supported during FAX communication established

9.10. +FTH Command: Transmit Data using HDLC Framing

AT+FTH : Transmit data using HDLC framing	**HiLo V1 only**
Test command Syntax **AT+FTH=?**	 Response (list of supported **< mode >**s) **OK**
Read command Syntax **AT+FTH?**	 Response **+FTH:<mode>** **OK**
Write command Syntax **AT+FTH=< mode >**	 Response **OK** Parameters **< mode >:** modulation used by the other modem to transmit data, using HDLC protocol 3: V21 channel 2 300 bps
Reference	Notes • This command is fully supported only in fax mode (AT+FCLASS=1)

9.11. +FMI Command: Manufacturer Identification

AT+FMI : Manufacturer identification	
Test command Syntax **AT+FMI=?**	 Response **OK**
Write command Syntax **AT+FMI**	 Response **<manufacturer>** **OK** Parameter
Reference EIA/TIA-578-D	Notes • See Manufacturer identification +CGMI

9.12. +FMM Command: Model Identification

AT+FMM : Model identification	
Test command Syntax **AT+FMM=?**	 Response **OK**
Write command Syntax **AT+FMM**	 Response **<model>** **OK** Parameter
Reference EIA/TIA-578-D	Notes • See Model identification +CGMM

9.13. +FMR Command: Revision Identification

AT+FMR : Revision identification	
Test command Syntax **AT+FMR=?**	 Response **OK**
Write command Syntax **AT+FMR**	 Response **<revision>** **OK** Parameter
Reference EIA/TIA-578-D	Notes • See Revision identification +CGMR

10. GPRS AT Commands

These commands are fully supported when the SIM card and the network have GPRS capability.

10.1. +CGATT Command: PS Attach or Detach

AT+CGATT : PS Attach or Detach	
Test command Syntax **AT+CGATT=?**	 Response **+CGATT:** (list of supported **<state>**s) **OK**
Read command Syntax **AT+CGATT?**	 Response **+CGATT: <state>** **OK**
Write command Syntax **AT+CGATT= <state>**	 Response **OK** Parameters **<state>:** indicates the state of PS attachment 0: detached 1: attached
Reference [27.007] §10.1.9	Notes

10.2. +CGACT Command: PDP Context Activate or Deactivate

AT+CGACT : PDP context activate or deactivate	
Test command Syntax **AT+CGACT=?**	 Response **+CGACT:** (list of supported **<state>**s) **OK**
Read command Syntax **AT+CGACT?**	 Response **+CGACT: <cid>, <state>** **OK**

AT+CGACT : PDP context activate or deactivate	
Write command Syntax **AT+CGACT= <state>[, <cid>]**	 Response **OK** Parameters **<state>:** indicates the state of PDP context activation 0: deactivated 1: activated Other values are reserved and will result in an ERROR response to the execution command **<cid>:** PDP Context Identifier is a numeric parameter which specifies a particular PDP context definition. (see +CGDCONT command)
Reference [27.007] §10.1.10	Notes After CGACT it is impossible to use ATD*99… or *98… commands

10.3. +CGCLASS Command: GPRS Mobile Station Class

AT+CGCLASS : GPRS mobile station class	
Test command Syntax **AT+CGCLASS=?**	 Response **+CGCLASS:** (list of supported **<class>**s) **OK**
Read command Syntax **AT+CGCLASS?**	 Response **+CGCLASS: <class>** **OK**
Write command Syntax **AT+CGCLASS=<class>**	 Response **OK** Parameters **<class>:** A string parameter which indicates the GPRS mobile class (in descending order of functionality) "B" class B "CC" class C in circuit switched only mode (lowest)
Reference [27.007] §10.1.17	Notes • Class A is not supported; the module must be restarted in order to be effective

10.4. +CGDCONT Command: Define PDP Context

<table>
<tr><th colspan="2">AT+CGDCONT : Define PDP context</th></tr>
<tr><td>Test command

Syntax
AT+CGDCONT=?</td><td>

Response
+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]][...]]
OK</td></tr>
<tr><td>Read command

Syntax
AT+CGDCONT?</td><td>

Response
+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp>[,<pd1>[,…[,pdN]]
OK</td></tr>
<tr><td>Write command

Syntax
AT+CGDCONT=<cid> ,<PDP_type> ,<APN> ,<PDP_addr> ,<d_comp> ,<h_comp></td><td>
Response
OK

Parameters
<cid>: (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition.
1..2 For HiLo V1 and HiLo V2
1 For HiLo3G and HiLoNC3GPS
3 For HiLo V2 only, not supported in HiLo V1
<PDP_type>: Packet Data Protocol type
A string parameter which specifies the type of packet data protocol. Only IP Internet Protocol - IETF STD 5) is supported.
<APN>: Access Point Name
A string parameter which is a logical name that is used to select the GGSN or the external packet data network.
<PDP_address>: a string parameter that identifies the MT in the address space applicable to the PDP. As only IP is currently supported, it shall be an IP address.
If the value is null (“0.0.0.0” or 0), then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested.
The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command.
<d_comp>: a numeric parameter that controls PDP data compression.
0: off (default and only value supported)
<h_comp>: a numeric parameter that controls PDP header compression
0: off (default and only value supported)
<pd1>, … <pdN>: zero to N string parameters whose meanings are specific to the <PDP_type></td></tr>
<tr><td>Reference
[27.007] §10.1.1</td><td>Notes
• The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command
• A special form of the set command, +CGDCONT= <cid> causes the values for context number <cid> to become undefined</td></tr>
</table>

10.5. +CGEREP Command: GPRS Event Reporting

AT+CGEREP : GPRS event reporting	
Test command Syntax **AT+CGEREP=?**	 Response **+CGEREP:** (list of supported **<mode>**s),(list of supported **<bfr>**s) **OK**
Read command Syntax **AT+CGEREP?**	 Response **+CGEREP: <mode>, <bfr>** **OK**
Write command Syntax **AT+CGEREP=[<mode>[,<bfr>]]**	 Response **OK** Parameters **<mode>:** 0: buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE. 1: discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE 2: buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE **<bfr>:** 0: MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered 1: MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes)
Reference [27.007] §10.1.18	Notes The unsolicited result codes supported are: +CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>] +CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>] +CGEV: ME DETACH +CGEV: NW DETACH

10.6. +CGPADDR Command: Show PDP Address

AT+CGPADDR : Show PDP address	
Test command Syntax **AT+CGPADDR=?**	 Response **+CGPADDR:** (list of supported **<cid>**s) **OK**
Write command Syntax **AT+CGPADDR=<cid>[,<cid>,[…]]**	 Response **+CGPADDR: <cid>, <PDP_addr>** **[+CGPADDR: <cid>, <PDP_addr>** **[…]]** **OK** Parameters **< PDP_addr >:** a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address> is omitted if none is available "<n>.<n>.<n>.<n>" where <n>=0..255 **<cid>:** a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT command)
Reference [27.007] §10.1.14	Notes • The execution command returns a list of PDP addresses for the specified context identifiers • Example : Ask for IP address according to cid=1 (identify the PDP context) AT+CGPADDR=1 +CGPADDR: 1, “10.20.30.40”

10.7. +CGQMIN Command: Quality of Service Profile (Minimum)

AT+CGQMIN : Define minimum acceptable quality of service profile	
Test command Syntax **AT+CGQMIN=?**	 Response **+CGQMIN: <PDP_type>**,(list of supported **<precedence>**s),(list of supported **<delay>**s),(list of supported **<reliability>**s),(list of supported **<peak>**s),(list of supported **<mean>**s) **[+CGQMIN:...]** **OK**
Read command Syntax **AT+CGQMIN?**	 Response **+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>** **[+CGQMIN: ...]** **OK**
Write command Syntax **AT+CGQMIN=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]**	 Response **OK**
Write command Syntax **AT+CGQMIN=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]**	Parameters **<precedence>:** numeric parameter for the precedence class 0: network subscribed value 1: High Priority Service commitments shall be maintained ahead of precedence classes 2 and 3 2: Normal priority Service commitments shall be maintained ahead of precedence class 3 3: Low priority **<delay>:** numeric parameter for the delay class **<reliability>:** numeric parameter for the reliability class 0: network subscribed value 1: Non real-time traffic , error-sensitive application that cannot cope with data loss 2: Non real-time traffic, error-sensitive application that can cope with infrequent data loss 3: Non real-time traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS 4: Real-time traffic, error-sensitive application that can cope with data loss 5: Real-time traffic, error non-sensitive application that can cope with data loss **<peak>:** numeric parameter for the peak throughput class 0: network subscribed value 1: Up to 1 000 (8 kbit/s) 2: Up to 2 000 (16 kbit/s) 3: Up to 4 000 (32 kbit/s) 4: Up to 8 000 (64 kbit/s) 5: Up to 16 000 (128 kbit/s) 6: Up to 32 000 (256 kbit/s) 7: Up to 64 000 (512 kbit/s) 8: Up to 128 000 (1 024 kbit/s) 9: Up to 256 000 (2 048 kbit/s) **<mean>:** numeric parameter for the mean throughput class

AT+CGQMIN : Define minimum acceptable quality of service profile		
	0: network subscribed value 1: 100 (~0.22 bit/s) 2: 200 (~0.44 bit/s) 3: 500 (~1.11 bit/s) 4: 1 000 (~2.2 bit/s) 5: 2 000 (~4.4 bit/s) 6: 5 000 (~11.1 bit/s) 7: 10 000 (~22 bit/s) 8: 20 000 (~44 bit/s) 9: 50 000 (~111 bit/s)	10: 100 000 (~0.22 kbit/s) 11: 200 000 (~0.44 kbit/s) 12: 500 000 (~1.11 kbit/s) 13: 1 000 000 (~2.2 kbit/s) 14: 2 000 000 (~4.4 kbit/s) 15: 5 000 000 (~11.1 kbit/s) 16: 10 000 000 (~22 kbit/s) 17: 20 000 000 (~44 kbit/s) 18: 50 000 000 (~111 kbit/s) 31: best effort
Reference [27.007] §10.1.7	Notes	

10.8. +CGQREQ Command: Request Quality of Service Profile

AT+CGQREQ : Request quality of service profile	
Test command Syntax **AT+CGQREQ=?**	Response **+CGQREQ: <PDP_type>**, (list of supported **<precedence>**s),(list of supported **<delay>**s),(list of supported **<reliability>**s),(list of supported **<peak>**s),(list of supported **<mean>**s) **[+CGQREQ: <PDP_type>**, (list of supported **<precedence>**s),(list of supported **<delay>**s),(list of supported **<reliability>**s),(list of supported **<peak>**s),(list of supported **<mean>**s) **[…]]** **OK**
Read command Syntax **AT+CGQREQ?**	Response **+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>** **[+CGQREQ: <cid>,<precedence>,<delay>,<reliability.>,<peak>,<mean>** **[…]]** **OK**
Write command Syntax **+CGQREQ=[<cid>** **[,<precedence >** **[,<delay> [,<reliability.>** **[,<peak> [,<mean>]]]]]]**	Response **OK** Parameters **<cid>:** a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT command). **<precedence>:** a numeric parameter which specifies the precedence class **<delay>:** a numeric parameter which specifies the delay class **<reliability>:** a numeric parameter which specifies the reliability class **<peak>:** a numeric parameter which specifies the peak throughput class

AT+CGQREQ : Request quality of service profile	
	<mean>: a numeric parameter which specifies the mean throughput class
Reference [27.007] §10.1.4	Notes • This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network • If a value is omitted for a particular class then the value is considered to be unspecified

10.9. +CGREG Command: GPRS Network Registration Status

AT+CGREG : GPRS network registration status	
Test command Syntax **AT+CGREG=?**	 Response **+CGREG:** (list of supported **<n>**s) **OK**
Read command Syntax **AT+CGREG?**	 Response **+CGREG: <n>,<stat>[,<lac,<ci>]** **OK**
Write command Syntax **AT+CGREG=[<n>]**	 Response **OK** Parameters **<n>:** 0: disable network registration unsolicited result code 1: enable network registration unsolicited result code +CGREG: <stat> 2: enable network registration and location information unsolicited result code +CGREG: <stat>[,<lac>,<ci>] **<stat>:** 0: not registered, ME is not currently searching an operator to register to The MS is in GMM state GMM-NULL or GMM-DEREGISTERED-INITIATED. The GPRS service is disabled, the MS is allowed to attach for GPRS if requested by the user. 1: registered, home network The MS is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED INITIATED on the home PLMN. 2: not registered, but ME is currently trying to attach or searching an operator to register to The MS is in GMM state GMM-DEREGISTERED or GMM-REGISTERED-INITIATED. The GPRS service is enabled, but an allowable PLMN is currently not available. The MS will start a GPRS attach as soon as an allowable PLMN is available. 3: registration denied The MS is in GMM state GMM-NULL. The GPRS service is disabled, the MS is not allowed to attach for GPRS if requested by the user. 4: unknown 5: registered, roaming The MS is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED on a visited PLMN **<lac>:** string type; two byte location area code in hexadecimal format (e.g.

AT+CGREG : GPRS network registration status	
	"00C3" equals 195 in decimal) **<ci>:** string type; two byte cell ID in hexadecimal format
Reference [27.007] §10.1.19	Notes • The set command controls the presentation of an unsolicited result code **+CGREG: <stat>** when **<n>**=1 and there is a change in the MT's GPRS network registration status, or code **+CGREG: <stat>[,<lac>,<ci>]** when <n>=2 and there is a change of the network cell

10.10. +CGSMS Command: Select Service for MO SMS Messages

AT+CGSMS : Set Greeting Text	
Test command Syntax **AT+CGSMS=?**	 Response **+CGSMS:** (list of currently available **<service>** s) **OK**
Read command Syntax **AT+CGSMS?**	 Response **+CGSMS: <service>** **OK**
Write command Syntax **AT+CGSMS=[<service>]**	 Response **OK** Parameter **<service> :** a numeric parameter which indicates the service or service preference to be used. 0: Packet Domain 1: Circuit switched 2: Packet Domain preferred (use circuit switched if GPRS not available) 3: Circuit switched preferred (use Packet Domain if circuit switched not available)
Reference [27.007] § 10.1.20	Notes • When **<service>** value is 2, the SMS is sent on GPRS network if already attached. Otherwise it is sent on circuit switched network. If an error occurs on the GPRS network, no further attempt is made

10.11. *PSGCNT Command: GPRS Counters

AT*PSGCNT : Get GPRS counters	**HiLoV2 HiAll only**
Test command Syntax **AT*PSGCNT=?**	 Response ***PSGCNT: (list of supported <CiD>s)**
Read command Syntax **AT*PSGCNT?**	Get counter values Response ***PSGCNT: <CiD>, <Rx bytes> , <Tx bytes> [..]** **<CR><LF>** ***PSGCNT: <CiD> <Rx bytes> , <Tx bytes> >** Parameters **<Rxbytes> :** <Integer type> Number of received bytes **<Txbytes> :** <Integer type> Number of transmitted bytes
Write command Syntax **AT*PSGCNT=<CiD>**	Reset counter Response **OK**
Write command Syntax **AT*PSGCNT=<CiD>**	 Parameters **<CiD> :** a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT command)
Reference Sierra Wireless Proprietary	• Set command reset the counter of <cid> given as parameter. (At switch on, all counters are reset) • Read command returns the current received and transmitted bytes (Rx & Tx) for all possible CiDs

10.12. +CGEQMIN Command: 3G Quality of Service Profile (Minimum)

Sets the UMTS QoS profile that is used in the Activate PDP Context Request message

AT+CGEQMIN : 3G Quality of Service Profile (Minimum acceptable)	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+CGEQMIN=?**	Response +CGEQMIN: "IP",(0-4),(0-5760),(0-7168),(0-5760),(0-7168),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"), ("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8") ,(0-3),(0,100-4000),(0-3) +CGEQMIN: "PPP",(0-4),(0-5760),(0-7168),(0-5760),(0-7168),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6") ,("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"), (0-3),(0,100-4000),(0-3) +CGEQMIN: "IPV6",(0-4),(0-5760),(0-7168),(0-5760),(0-7168),(0-2),(0-1520),("0E0" ,"1E1","1E2","7E3","1E3","1E4","1E5","1E6") ,("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"), (0-3),(0,100-4000),(0-3) **OK**
Write command Syntax +CGEQMIN = <cid>, <Traffic_class>, <maximum_bitrate_UL>, <maximum_bitrate_DL>, <Guaranteed_bitrate_UL>, <Guaranteed_bitrate_DL>, <Delivery_order>, <Maximum_SDU_size>, <SDU_error_ratio>, <Residual_bit_error_ratio>, <Delivery_of_erroneous_SDUs>, <Transfer_delay>, <Traffic_handling_priority>	Response **OK** Parameter values per specifications; parameter values supported are: <cid>:1 to 16 <Traffic_class>: 0 to 4 <maximum_bitrate_UL>: 0 to 384 <maximum_bitrate_DL>: 0 to 384 <Guaranteed_bitrate_UL>: 0 to 384 <Guaranteed_bitrate_DL>:0 to 384 <Delivery_order>:0 to 2 <Maximum_SDU_size>: 0 to 1520 <SDU_error_ratio>: 0E0, 1E1, 1E2, .7E3, 1E3, 1E4, 1E5, 1E6

AT+CGEQMIN : 3G Quality of Service Profile (Minimum acceptable)	HiLo3G HiLoNC3GPS
Write command Syntax +CGEQMIN = <cid>, <Traffic_class>, <maximum_bitrate_UL>, <maximum_bitrate_DL>, <Guaranteed_bitrate_UL>, <Guaranteed_bitrate_DL>, <Delivery_order>, <Maximum_SDU_size>, <SDU_error_ratio>, <Residual_bit_error_ratio>, <Delivery_of_erroneous_SDUs>, <Transfer_delay>, <Traffic_handling_priority>	<Residual_bit_error_ratio>: .. 0E0 , 5E2 , 1E2 , 5E3, 4E3, 1E3 ,1E4,1E5,1E6, 6E8 <Delivery_of_erroneous_SDUs>: 0 to 3 <Transfer_delay>: 0,100 to 4000 <Traffic_handling_priority>:0 to 3 Set values are saved across power cycles
Reference [27.007] § 10.1.7	Notes • Setting these parameters will reset +CGQMIN and +CGQREQ to defaults

10.13. +CGEQREQ Command: 3G Quality of Service Profile (Requested)

AT+CGEQREQ : 3G Quality of Service Profile (Requested)	HiLo3G HiLoNC3GPS
Test command Syntax **AT+CGEQREQ=?**	Response +CGEQREQ: "IP",(0-4),(0-5760),(0-7168),(0-5760),(0-7168),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3) +CGEQREQ: "PPP",(0-4),(0-5760),(0-7168),(0-5760),(0-7168),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3) +CGEQREQ: "IPV6",(0-4),(0-5760),(0-7168),(0-5760),(0-7168),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3" ,"1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3) **OK**

AT+CGEQREQ : 3G Quality of Service Profile (Requested)	**HiLo3G HiLoNC3GPS**
Write command Syntax +CGEQREQ= <cid>, <Traffic_class>, <maximum_bitrate_UL>, <maximum_bitrate_DL>, <Guaranteed_bitrate_UL>, <Guaranteed_bitrate_DL>, <Delivery_order>, <Maximum_SDU_size>, <SDU_error_ratio>, <Residual_bit_error_ratio>, <Delivery_of_erroneous_SDUs>, <Transfer_delay>, <Traffic_handling_priority>	Response **OK** Parameter values per specifications; parameter values supported are: <cid> :1 to 16 <Traffic_class> : 0 to 4 <maximum_bitrate_UL> : 0 to 384 <maximum_bitrate_DL> : 0 to 384 <Guaranteed_bitrate_UL> : 0 to 384 <Guaranteed_bitrate_DL> :0 to 384 <Delivery_order> :0 to 2 <Maximum_SDU_size> : 0 to 1520 <SDU_error_ratio> : 0E0 , 1E1 , 1E2 , .7E3, 1E3 , 1E4, 1E5, 1E6 <Residual_bit_error_ratio>: .. 0E0 , 5E2 , 1E2 , 5E3, 4E3, 1E3 ,1E4,1E5,1E6, 6E8 <Delivery_of_erroneous_SDUs> : 0 to 3 <Transfer_delay>: 0, 100 to 4000 <Traffic_handling_priority> : 0 to 3 Set values are saved across power cycles
Reference [27.007] § 10.1.6	Notes • Setting these parameters will reset +CGQMIN and +CGQREQ to defaults

10.14. +CGEQNEG Command: 3G Quality of Service Profile (Negotiated)

AT+CGEQMIN : 3G Quality of Service Profile (Negotiated)	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+CGEQNEG=?**	Response +CGEQNEG: (list of <cid>s associated with active contexts) **OK**
Write command Syntax +CGEQNEG =[<cid>[,<cid>[,…]]]	Response **+CGEQNEG: <cid>, <Traffic class>,<Maximum bitrate UL> ,<Maximum bitrate DL>, <Guaranteed bitrate UL>,** **<Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>,** **<Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority> [<CR><LF>**

AT+CGEQMIN : 3G Quality of Service Profile (Negotiated)	**HiLo3G HiLoNC3GPS**
Write command Syntax +CGEQNEG =[<cid>[,<cid>[,…]]]	**+CGEQNEG: <cid>, <Traffic class>,<Maximum bitrate UL> ,<Maximum bitrate DL>, <Guaranteed bitrate UL>,** **<Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>,** **<Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority> [<CR><LF>** […]] OK
Reference [27.007] § 10.1.8	Notes

11. SIM Application Toolkit AT Commands

11.1. Preliminary comments

- Sierra Wireless has developed a proprietary set of commands to allow a DTE to interface with the SIM Application Toolkit.
- Details about the implementation of the SIM Application Toolkit are provided in [STK].
- The following table gives the list of each SIM ToolKit *PSSTK command parameter and the *PSSTK URC Format.

Command name	*PSSTK URC Format	*PSSTK command parameters list
COMMAND REJECTED	NULL	AT*PSSTK = "COMMAND REJECTED",CommandNumber, cause
NOTIFICATION	*PSSTK: "NOTIFICATION", <CommandNumber>, <TypeOfCommand>, <Presence>, <Alphabet>, <AlphaId>, <IconId>, <IconQualifier>	AT*PSSTK = "NOTIFICATION", CommandNumber, IconDisplay
SETUP CALL	*PSSTK: "SETUP CALL", <CommandNumber>,<TypeOfCommand>,<Confirmation>,<Presence1>,<Alphabet1>,<AlphaId1>,<IconId1>,<IconQualifier1>,<Presence2>,<Alphabet2>,<AlphaId2>,<IconId2>,<IconQualifier2>,<RepeatIndication>	AT*PSSTK ="SETUP CALL", CommandNumber, IconDisplay
DISPLAY TEXT	*PSSTK: "DISPLAY TEXT", <CommandNumber>,<Priority>,<Clear>,<ImmediateResponse>,<Alphabet>,<Text>,<IconId>,<IconQualifier>	AT*PSSTK ="DISPLAY TEXT", CommandNumber, IconDisplay
GET INKEY	*PSSTK: "GET INKEY", <CommandNumber>, <ResponseFormat>, <ResponseAlphabet>, <HelpInfo>,<Alphabet>,<Text>,<IconId>,<IconQualifier>	AT*PSSTK ="GET INKEY", alphabet,Text,CommandNumber, IconDisplay, HelpRequest
GET INPUT	*PSSTK: "GET INPUT", <CommandNumber>, <ResponseFormat>,<ResponseAlphabet>,<HideEntry>,<AlphabetText>,<Text>,<IconId>,<IconQualifier>,<AlphabetDefault>,<DefaultText>,<MinLength>,<MaxLength>,<HelpInfo>	AT*PSSTK ="GET INPUT", CommandNumber,alphabet,Text, IconDisplay, HelpRequest
PLAY TONE	*PSSTK: "PLAY TONE", <Presence>, <Alphabet>, <AlphaId>, <IconId>, <IconQualifier>, <CommandNumber>, <Tone>,<Duration>	AT*PSSTK ="PLAY TONE", CommandNumber, IconDisplay
SELECT ITEM	*PSSTK: "SELECT ITEM", <Presence>, <AlphaId>, <Alphabet>,<IconId>, <IconQualifier>, <CommandNumber>, <DefaultItem>, <HelpInfo>, <NumberOfItem>	AT*PSSTK ="SELECT ITEM", CommandNumber,ItemIdentifier, IconDisplay, IconDisplay,HelpRequest
SETUP MENU	*PSSTK: "SETUP MENU", <Presence>, <Alphabet>, <AlphaId>, <IconId>, <IconQualifier>, <CommandNumber>,<DefaultItem>,<HelpInfo>,<NumberOfItem>	AT*PSSTK ="SETUP MENU",CommandNumber, IconDisplay
REMOVE MENU	*PSSTK: "REMOVE MENU",<CommandNumber>	AT*PSSTK ="REMOVE MENU", CommandNumber

Command name	*PSSTK URC Format	*PSSTK command parameters list
MENU SELECTION	NULL	AT*PSSTK ="MENU SELECTION",ItemIdentifier
ALL CALLS DISCONNECTED	NULL	AT*PSSTK ="ALL CALLS DISCONNECTED "
USER ACTIVITY	NULL	AT*PSSTK ="USER ACTIVITY"
IDLE SCREEN AVAILABLE	NULL	AT*PSSTK ="IDLE SCREEN AVAILABLE"
SETUP CALL TERMINATED	NULL	AT*PSSTK ="SETUP CALL TERMINATED "
GET ITEM LIST	*PSSTK:"GET ITEM LIST", <Item_index>,<ItemIdentifier>,<Alphabet>, <p_Text>,<NextAction>,<IconId>, <IconQualifier>	AT*PSSTK ="GET ITEM LIST", NumberOfItems
LANGUAGE NOTIFICATION	*PSSTK:"LANGUAGE NOTIFICATION", <CommandNumber>,<SpecificLanguage>, <SimLanguage>	NULL
SETUP IDLE MODE TEXT	*PSSTK:"SETUP IDLE MODE TEXT", <CommandNumber>, <Alphabet>, <Text>, <IconId>, <IconQulifier>	AT*PSSTK ="SETUP IDLE MODE TEXT", CommandNumber, IconDisplay
REFRESH	*PSSTK: "REFRESH",<CommandNumber>,<RefreshType>	NULL
END CALL	*PSSTK:"ENDCALL",<CommandNumber>,<Cause Select>,<Cause>,<CallId>	NULL
DISCONNECT	*PSSTK="DISCONNECT",<CauseSelect>,<Cause>,<CallIdListStatus0>,<CallIdListStatus1>,<CallIdListStatus2>,<CallIdListStatus3>,<CallIdListStatus4>,<CallIdListStatus5>,<CallIdListStatus6>,<CallId>,<MaxNumberOfCallRepeatAttempts>,<RepeatCallAttemptWaitingTime>,<CallIdPreviousState>	NULL
PROCESSING	*PSSTK: "PROCESSING",<CommandNumber>	NULL
END SESSION	*PSSTK: "END SESSION"	NULL
ABORT SESSION	*PSSTK: "ABORT SESSION"	NULL
CONTROL BY SIM	*PSSTK: "CONTROL BY SIM",<TypeOfCommand>,<Presence>,<Alphabet>, <AlphaId>	NULL

11.2. *PSSTKI Command: SIM ToolKit Interface Configuration

AT*PSSTKI : SIM ToolKit Interface configuration	
Test command Syntax **AT*PSSTKI=?**	Response ***PSSTKI:** (List of supported **<mode>**s) **OK**

AT*PSSTKI : SIM ToolKit Interface configuration	
Read command Syntax **AT*PSSTKI?**	 Response ***PSSTKI:<mode>** **OK**
Write command Syntax **AT*PSSTKI=<mode>**	 Response **OK** Parameter **<mode>:** 0: no *PSSTK unsolicited result code will be sent to TE. TE won't send *PSSTK command to Module. This mode is useful for basic stk and certification process. 1: manual mode : any *PSSTK unsolicited result code will be sent to TE. TE has to acknowledge to *PSSTK notification. For example : URC: *PSSTK: "SETUP MENU",1,4,"SIMOP",0,0,1,0,0,6 TE answer : AT*PSSTK="SETUP MENU",1,0 2: auto acknowledge mode: module answers to STK without TE,. any *PSSTK unsolicited result code will be sent to TE 3: auto acknowledge mode without sending unsolicited result code to TE
Reference Sierra Wireless Proprietary	Notes • The aim of this AT command is to configure the AT interface for SIM ToolKit support

11.3. *PSSTK Command: SIM Toolkit

AT*PSSTK : SIM Toolkit using *PSSTK as command	
Write command Syntax **AT*PSSTK=<msg>,<parameter1>,…,<parameterN>**	 Response **OK** Parameters **<msg>:** 1 Command requires a SIM Toolkit answer: "MENU SELECTION" "GET ITEM LIST" 2 Command does not require a SIM Toolkit answer: "ALL CALLS DISCONNECTED" "USER ACTIVITY" "IDLE SCREEN AVAILABLE" "SETUP CALL TERMINATED" 3 Command used to answer an unsolicited result code: "COMMAND REJECTED" "NOTIFICATION" "SETUP CALL" "DISPLAY TEXT" "GET INKEY" "GET INPUT" "PLAY TONE" "SELECT ITEM"

AT*PSSTK : SIM Toolkit using *PSSTK as command	
	"SETUP MENU" "REMOVE MENU" "SETUP IDLE MODE TEXT" **<parameter i>:** Depends of **<msg>** value, For each value of **<msg>** a parameter list is defined. For detail information about parameter list, please see the table in § 11.1
Reference Sierra Wireless Proprietary	Notes The *PSSTK can be used in two different ways: • *PSSTK is an unsolicited result code received from SIM Toolkit application • *PSSTK is sent by the DTE to the ME (used as a normal AT command)

11.4. *PSSTK URC: SIM Toolkit Unsolicited Result Code

*PSSTK : Unsolicited result code or possible response(s)	
Result code or Possible response(s)	Response ***PSSTK: <msg>,<parameter1>, …, <parameterN>** **OK** Parameters **<msg>:** 1 Unsolicited result code not requiring an answer from DTE "LANGUAGE NOTIFICATION" "CONTROL BY SIM" "REFRESH" "END CALL" "DISCONNECT" "PROCESSING" "END SESSION" "ABORT SESSION" 2 Unsolicited result code requiring an answer from DTE "NOTIFICATION" "SETUP CALL" "DISPLAY TEXT" "GET INKEY" "GET INPUT" "PLAY TONE" "SELECT ITEM" "SETUP MENU" "REMOVE MENU" "SETUP IDLE MODE TEXT” **<parameter i>:** Depends of **<msg>** value, For each value of **<msg>** a parameter list is defined. For detail information about parameter list, please see the table in § 11.1
	Notes The *PSSTK can be used in two different ways: • *PSSTK is an unsolicited result code received from SIM Toolkit application • *PSSTK is sent by the DTE to the ME (used as a normal AT command)

12. Audio commands

12.1. Preliminary comments

The current "preliminary comments" section deals with AT commands: VIP, VGR, VGT, KVGR, KVGT, KECHO, KNOISE, KST, KPC and KSRAP.

12.1.1. General behavior

The commands cited above and presented here after can be used to tune audio parameters such as gain (up and down), volume, side tone, modes (handset, hands free…) and to activate some audio features such as noise reduction, echo cancellation and peak compressor. The following sections will indicate how to use the commands and with which parameters.

To explain briefly the global behavior, it is important to note that the audio parameters are stored in FLASH memory and loaded into RAM at each power up. The parameters are divided into organs, each configuration (handset, hands free) are in fact a couple of one RX organ and one TX organ. The command AT+VIP will allow to choose a configuration, so a couple of organs.

At the beginning of a call, selected organs are sent to the DSP.

The modifications done by the commands described after will modify audio parameter values in RAM. If the user does not save the values, they will be lost at the next power up. Nevertheless, a command allows the user to save values in FLASH and also allows restoring initial parameter values (the ones set prior to make any change on audio parameters).

12.1.2. Warning

The AT+VIP command has 2 purposes:

1. "Parameter change context" selects the current context (handset, hands free) for user modifications:
   This context lasts between 2 AT+VIP commands

2. "Pre-selected communication context" pre-selects the context that will be sent to the DSP for a communication;
   This context lasts from the AT+VIP command to the end of a call

As these 2 contexts may not have the same “time to live”, we recommend to resend AT+VIP command with the desired mode prior to make a call

As an example:

AT+VIP=1	<- Selects Hands free mode.
AT+KVGR=”10”	<- Set the Downlink gain to 10 dB for hands free mode.
ATDxxxxxxx;	<- Make a call in hands free mode.
ATH	<- Release the call: “parameter change context” is still hands free, "pre-selected communication context" is reset (as AT+VIP=0,handset mode).
AT+KVGR=”5”	<- Set the Downlink gain to 5 dB for hands free mode.
ATDxxxxxxx;	<- Make a call. It is in HANDSET mode.

AT+VIP=0 <- Selects handset mode.

AT+KVGT=”-5” <- Set the Uplink gain to -5 dB for handset mode.

Note: To bypass this issue, use an AT+VIP command with the desired mode prior to make a call.

12.2. +CLVL Command: Loudspeaker Volume Level

AT+CLVL : Loudspeaker volume level	
Test command Syntax **AT+CLVL=?**	 Response **+CLVL:** (list of supported **<level>**s) **OK**
Read command Syntax **AT+CLVL?**	 Response **+CLVL: <level>** **OK**
Write command Syntax **AT+CLVL=<level>**	 Response **OK** Parameter **<level>:** Loudspeaker level (smallest value represents the lowest sound)
Reference [27.007] § 8.23	Notes

12.3. +VIP Command: Initialize Voice Parameters

AT+VIP : Initialize voice parameter	
Test command Syntax **AT+VIP=?**	 Response (list of supported **<n>**s) **OK**
Read command Syntax **AT+VIP?**	 Response **+VIP:<n>** **OK**

AT+VIP : Initialize voice parameter	
Write command Syntax **AT+VIP=<n>**	Response **OK** Parameters **<n>:** Mode 0 Handset (not supported by HiLoNC3GPS) 1 Hands free (not supported by HiLoNC3GPS) 2 Handset raw (not supported by HiLoNC3GPS) 3 Ecall during voice transmission (only HiLoV2 and HiAll) 4 Ecall during data transmission (only HiLoV2 and HiAll) 23 PCM interface (not supported by HiLoV1)
Reference [27.007] § C.2.6	Notes • The values are automatically reset after a call (return to 0) • Level volume are accessible with AT+CLVL • Modes 3 and 4 are specific to ECALL and Sierra Wireless recommends NO modification to the audio settings for these modes. (See §16.2 Audio Settings during ECALL)

12.4. +VTS Command: DTMF and Tone Generation

AT+VTS : Dual Tone Multi-Frequency (DTMF) and tone generation	
Test command Syntax **AT+VTS=?**	Response (list of supported **<tone1>**s),(list of supported **<tone2>**s) ,(list of supported **<duration>**s) **OK**
Write command Syntax **AT+VTS="<DTMF1>,<DTMF2>, …, <DTMFn>"** Or **AT+VTS= "{<DTMF1>, <duration>, {<DTMF2>, <duration>,…{<DTMFn>, <duration>}"**	Response **OK** Parameters **<DTMFi>:** A single ASCII character in the set 0-9, #,*,A-D. This is interpreted as a single ACSII character whose duration is set by the +VTD command. DTMF tones can be issued only during a voice call **<tone1><tone2><duration>:** This is interpreted as a dual tone of frequencies <tone1> and <tone2>, lasting for a time <duration> (in 10 ms multiples). This does not operate in GSM **< DTMFi >,<duration>:** This is interpreted as a DTMF tone of different duration from that mandated by the +VTD command. In GSM this operates only in voice mode

AT+VTS : Dual Tone Multi-Frequency (DTMF) and tone generation	
Reference [27.007] § C.2.11	Notes • The network shall ensure that the minimum length of tone and the minimum gap between two subsequent tones (according to ETR 206) is achieved. (In ETR 206 the minimum duration of a DTMF tone is 70ms ±5ms, the minimum gap between DTMF tones is 65ms). There is no defined maximum length to the tone, however, the operator may choose to put a pre-defined time limit on the duration of tones sent to line (cf. [23.014]). That means that with n<6, DTMF will be generated with a duration given by the network • Total number of parameters is limited to 9 for HiLo3G and HiLoNC3GPS

12.5. +VTD Command: Tone Duration

AT+VTD : Tone duration	
Test command Syntax **AT+VTD=?**	 Response (list of supported **<n>**s) **OK**
Read command Syntax **AT+VTD?**	 Response **<n>** **OK**
Write command Syntax **AT+VTD=<n>**	 Response **OK** Parameters **<n>:** 0: default setting (Default duration of the tone is 7/10 second) 1-100 duration of the tone in 1/10 seconds
Reference [27.007] § C.2.12	Notes • The network shall ensure that the minimum length of tone and the minimum gap between two subsequent tones (according to ETR 206) is achieved. (In ETR 206 the minimum duration of a DTMF tone is 70ms ±5ms, the minimum gap between DTMF tones is 65ms). There is no defined maximum length to the tone, however, the operator may choose to put a pre-defined time limit on the duration of tones sent to line (cf. [23.014]). That means that with n<6, DTMF will be generated with a duration given by the network.

12.6. +VGR Command: Receive Gain Selection

AT+VGR : Set receive gain	
Test command Syntax **AT+VGR=?**	 Response (list of supported **<n>**s) **OK**

AT+VGR : Set receive gain	
Read command Syntax **AT+VGR?**	 Response **+VGR:<n>** **OK**
Write command Syntax **AT+VGR=<n>**	 Response **OK** Parameters **<n>:** < 128 (128 - n) dB less than nominal gain (until -20 dB) 128 Nominal gain > 128 (n-128) dB more than nominal gain (up to 18 dB)
Reference [27.007] § C.2.4	Notes: • If the current or the requested value goes out of the gain range (-20 to 18 dB), the command returns an error

12.7. +VGT Command: Transmit Gain Selection

AT+VGT : Set transmit gain	
Test command Syntax **AT+VGT=?**	 Response (list of supported **<n>**s) **OK**
Write command Syntax **AT+VGT?**	 Response **+VGT:<n>** **OK**
Write command Syntax **AT+VGT=<n>**	 Response **OK** Parameters **<n>:** < 128 (128 - n) dB less than nominal gain (until -20 dB) 128 Nominal gain > 128 (n-128) dB more than nominal gain (until 18 dB)
Reference [27.007] § C.2.5	Notes: • If the current or the requested value goes out of the gain range (-20 to 18 dB), the command returns an error

12.8. +KVGR Command: Receive Gain Selection

AT+KVGR : Set receive gain	
Test command Syntax **AT+KVGR=?**	 Response (list of supported **<n>**s) **OK**
Write command Syntax **AT+KVGR?**	 Response **+KVGR:<n>** **OK**
Write command Syntax **AT+KVGR=<n>**	 Response **OK** Parameters **"<n>":** -20 to 18: In dB, Digital gain of the downlink path For HiLo3G and HiLoNC3GPS: **"<n>":** -20 to 12: In dB, Digital gain of the downlink path
Reference Sierra Wireless Proprietary	Notes • The parameter is a string in order to accept negative values, so the value MUST be written between quotes ("xx")

12.9. +KVGT Command: Transmit Gain Selection

AT+VGT : Set transmit gain	
Test command Syntax **AT+KVGT=?**	 Response (list of supported **<n>**s) **OK**
Write command Syntax **AT+KVGT?**	 Response **+KVGT:<n>** **OK**
Write command Syntax **AT+KVGT=<n>**	 Response **OK** Parameters **"<n>":** -20 to 18: In dB, Digital gain of the uplink path For HiLo3G and HiLoNC3GPS: **"<n>":** -20 to 12: In dB, Digital gain of the downlink path

AT+VGT : Set transmit gain	
Reference Sierra Wireless Proprietary	Notes • The parameter is a string in order to accept negative values, so the value MUST be written between quotes ("xx")

12.10. +KECHO Command: Echo Cancellation

AT+KECHO : Set ECHO cancellation mode	
Test command Syntax **AT+KECHO=?**	 Response +**KECHO:** (list of supported **<status>**s) **OK**
Read command Syntax **AT+KECHO?**	 Response **+KECHO: <status>** **OK**
Write command Syntax **AT+KECHO=<level>**	 Response **OK** Parameter **<status>:** 0 Deactivate ECHO Cancellation 1 ECHO Cancellation 2 ECHO Cancellation and Suppression UL path (not supported by HiLo3G and HiLoNC3GPS)
Reference Sierra Wireless Proprietary	

12.11. +KNOISE Command: Noise Cancellation

AT+KNOISE : Select noise suppression activation	
Test command Syntax **AT+KNOISE=?**	 Response **+KNOISE:** (list of supported **<Receive>**s), (list of supported **<Transmit>**s) **OK**
Read command Syntax **AT+KNOISE?**	 Response **+KNOISE: <Receive>,<Transmit>** **OK**

AT+KNOISE : Select noise suppression activation	
Write command Syntax **AT+KNOISE=<Receive>,<Transmit>**	Response **OK** Parameter **<Receive>:** 0 OFF 1 ON **<Transmit>:** 0 OFF 1 ON
Reference Sierra Wireless Proprietary	

AT+KNOISE : Select noise suppression activation	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+KNOISE=?**	Response **+KNOISE:** (list of supported **<Transmit>**s) **OK**
Read command Syntax **AT+KNOISE?**	Response **+KNOISE: <Transmit>** **OK**
Write command Syntax **AT+KNOISE= <Transmit>**	Response **OK** Parameter **<Transmit>:** 0 OFF 1 ON
Reference Sierra Wireless Proprietary	

12.12. +KST Command: Side Tone

AT+KST : Set side tone value	
Test command Syntax **AT+KST=?**	Response **+KST:** (list of supported **<level>**s) **OK**
Read command Syntax	Response

AT+KST : Set side tone value	
AT+KST?	**+KST: <level>** **OK** Parameter **<level>:** 0,..,16 Side Tone value 20: Side Tone disable
Write command Syntax **AT+KST=<level>**	 Response **OK** Parameter **<level>:** 0…16: Side Tone value (side tone gain from -26dB o 6dB by step of 2) 20: Disable Side Tone
Reference Sierra Wireless Proprietary	Notes • Volume must be set to 5 (AT+CLVL = 5) • Values cannot be modified on the fly (only disable on the fly). To observe the changes, a supplementary call is required. • When modifying the side tone, double check to have set the right VIP value prior to redial (see warning section 12.1.2)

12.13. +KPC Command: Peak Compressor

AT+KPC : Peak compressor activation	
Test command Syntax **AT+KPC=?**	 Response **+KPC:** (list of supported **<level>**s) **OK**
Read command Syntax **AT+KPC?**	 Response **+KPC: <level>** **OK**
Write command Syntax **AT+KPC=<level>**	 Response **OK** Parameter **<level>:** 0 Disable 1 Enable
Reference Sierra Wireless Proprietary	

12.14. +KSRAP Command: Save or Restore Audio Parameters

AT+KSRAP : Save/restore audio parameters	
Test command Syntax **AT+KSRAP=?**	 Response +**KSRAP :** (list of supported **<level>**s) **OK**
Write command Syntax **AT+KSRAP=<level>**	 Response **OK** Parameter **<level>:** 0 Save Audio Parameter in EEPROM 1 Restore Initial Audio Parameter 2 Restore Audio Parameters in RAM and save in EEPROM
Reference Sierra Wireless Proprietary	Notes • Initial Audio Parameters are the ones before any parameter modification done by these AT commands.

12.15. +KDSPTX Command: Read TX Audio Parameters

AT+KDSPTX : Read TX audio parameters	**HiLoV2 HiAll only**
Read command Syntax **AT+KDSPTX?**	 Response (list of supported audio parameters) **OK**
Reference Sierra Wireless Proprietary	Notes

12.16. +KDSPRX Command: Read RX Audio Parameters

AT+KDSPRX : Read RX audio parameters	**HiLoV2 HiAll only**
Read command Syntax **AT+KDSPRX?**	 Response (list of supported audio parameters） **OK**
Reference Sierra Wireless Proprietary	Notes

12.17. +KPCMTXVOL Command: Tx Volume of PCM Interface

AT+KPCMTXVOLT : Set PCM Interface transmission volume	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+KPCMTXVOL=?**	 Response **+KPCMTXVOL:<level>** **OK**
Read command Syntax **AT+KPCMTXVOL?**	 Response **+KPCMTXVOL: <level>** **OK**
Write command Syntax **AT+KPCMTXVOL=<level>**	 Response **OK** Parameter **<level>:** 0 to FFFF: in Hex value. Prefix string "0x" is unnecessary 0: -84dB 4000: 0dB FFFF: +12dB
Reference	Notes Range from –84dB to +12dB. (0dB was 0x4000) TxVolume (dB) = 20 x LOG(TxVolume /16384)

12.18. +KPCMRXVOL Command: Rx Volume of PCM Interface

AT+KPCMRXVOL : Set PCM Interface reception volume	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+KPCMRXVOL=?**	 Response **+KPCMRXVOL:** **RXVOLUME0 : <level>** **RXVOLUME1 : <level>** **RXVOLUME2 : <level>** **RXVOLUME3 : <level>** **RXVOLUME4 : <level>** **RXVOLUME5 : <level>** **OK**
Read command Syntax **AT+KPCMRXVOL?**	 Response **+KPCMRXVOL:** **RXVOLUME0 : <level>** **RXVOLUME1 : <level>** **RXVOLUME2 : <level>** **RXVOLUME3 : <level>** **RXVOLUME4 : <level>** **RXVOLUME5 : <level>** **OK**
Write command Syntax **AT+KPCMRXVOL=<volume>,<level>**	 Response **OK** Parameter **<volume>:** RXVOLUME0 to RXVOLUME5 **<level>:** -5000 to 1200, in decimal values
Reference	Notes Range from –50dB to +12dB. (0dB was 0, 12dB was 1200.) RxVolume(dB) = RxVolume / 100

12.19. +KPCMCFG Configure PCM Digital Audio

AT+KPCMCFG : Configure PCM digital audio	**HiLo V2 only**
Test command Syntax **AT+KPCMCFG=?**	Response (list of supported **<mode>**s, **<Length>**,**<DataCfg>**,**<SamplingCtrl>** [,**<BitClk>**s]) **OK**
Read command Syntax **AT+KPCMCFG?**	Response **+KPCMCFG:<mode>,<Length>,<DataCfg>,<SamplingCtrl> [,<BitClk>]** **OK**
Write command Syntax **AT+KPCMCFG=<mode>,<Length>,<DataCfg>,<SamplingCtrl> [,<BitClk>]**	Response **OK** Parameters **<mode>:** PCM Mode 0 Slave 1 Master
Write command Syntax **AT+KPCMCFG=<mode>,<Length>,<DataCfg>,<SamplingCtrl> [,<BitClk>]**	**<Length>:** PCM data word length 0 8 bits 1 16 bits **<DataCfg>:** Serial data configuration 0 LSB first 1 MSB first **<SamplingCtrl>:** Sampling clock edge control 0 falling edge 1 rising edge **<BitClk>:** PCM bit clock (if Master mode selected) 0 1000 KHz (default) 1 500 KHz 2 333 KHz 3 250 KHz 4 200 KHz 5 166,667 KHz 6 142,857 KHz 7 125 KHz 8 111,111 KHz 9 100 KHz 10 90,909 KHz 11 83,333 KHz 12 76.923 KHz

AT+KPCMCFG : Configure PCM digital audio	**HiLo V2 only**
Reference Sierra Wireless proprietary	Notes • The Linear law and Frame clock at **8 Khz** PCM configuration is used and cannot be modified by user • In the master mode, the PCM interface generates the PCM clock and frame synchronization signal • In the slave mode, the PCM interface accepts the PCM clock and frame synchronization signal and supports maximum bit clock rate of 1.625 MHz. • The values are saved and kept after reboot • Level volumes can be modified using +VGT, +VGR, +KVGT, +KVGR commands

AT+KPCMCFG : Configure PCM digital audio	**HiLoNC3GPS only**
Test command Syntax **AT+KPCMCFG=?**	 Response (list of supported **<mode>**s,**<Length>**,**<Sync Mode>**,**<BitClk>**) **OK**
Read command Syntax **AT+KPCMCFG?**	 Response **+KPCMCFG:<mode>,<Length>,<Sync Mode> [,<BitClk>]** **OK**
Write command Syntax **AT+KPCMCFG=<mode>, <Length>,<Sync Mode> [,<BitClk>]**	 Response **OK** Parameter **<mode>:** PCM Mode 0 Slave (Only support 2048KHz bit clock) 1 Master **<Length>:** PCM data word length 0 8 bits a/law 1 8 bits mu/law 2 16 bits linear **<Sync Mode>:** 8k Hz Sync mode 0 short sync mode 1 long sync mode (only if Master mode selected) **<BitClk>:** PCM bit clock (only if Master mode selected) 0 128 KHz 1 2048KHz
Reference	Notes

13. Protocol specific commands

13.1. Preliminary comments

Sierra Wireless has developed a set of proprietary AT Commands to simplify data exchanges with different protocols:

- FTP
- TCP/IP
- UDP
- SMTP
- POP3

13.2. Connection configuration

13.2.1. +KCNXCFG: GPRS Connection Configuration

AT+KCNXCFG : GPRS Connection configuration	
Test command Syntax **AT+KCNXCFG=?**	 Response **+KCNXCFG:** (list of possible **<cnx conf>**s) **OK**
Read command Syntax **AT+KCNXCFG?**	 Response **+KCNXCFG: <cnx cnf>, " GPRS", <apn>,<login>,<password>, <ip>,<dns1>,<dns2>** **+KCNXCFG: <cnx cnf>, "GPRS",<apn>,<login>,<password>, <ip>,<dns1>,<dns2> [...]** **OK**
Write command Syntax **AT+KCNXCFG=<cnx cnf>,"GPRS",<apn>[,[<login>][,[<password>][,[<ip>][,[<dns1>][,<dns2>]]]]]**	 Response **OK** Parameters **<cnx cnf>:** [0..7] (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration **<apn>:** (Access Point Name) a string parameter (max size 63 bytes), logical name used to select the GGSN or the external packet data network. **<login>:** string type (max size 24 bytes), indicates the user name of the cnx **<password>:** string type (max size 24 bytes), indicates the password of the cnx

AT+KCNXCFG : GPRS Connection configuration	
Write command Syntax **AT+KCNXCFG=<cnx cnf>,"GPRS",<apn>[,[<login>][,[<password>][,[<ip>][,[<dns1>][,<dns2>]]]]]**	**<ip>:** String type. Consists of dot-separated numeric (0-255) parameters on the form a1.a2.a3.a4, if the mobile is supposed to work with a static address. For dynamic address the value is "0.0.0.0" or an empty string. Displayed value with read command will be "0.0.0.0" for dynamic address. Note that with an empty value in the write command the previously stored value will be used. **<dns1>, <dns2>:** String type. Consists of dot-separated numeric (0-255) parameters on the form a1.a2.a3.a4, if the mobile is supposed to work with static DNS addresses. For dynamic addresses the value is "0.0.0.0" or an empty string. Displayed value with read command will be "0.0.0.0" for dynamic address. Note that with an empty value in the write command the previously stored value will be kept.
Reference Sierra Wireless Proprietary	Notes • This AT command is used to configure the bearer to be used for the future IP Services • By default, the IP and DNS address are dynamic (those values would be affected by the network during the GSM or GPRS connection • This connection will be used by the Module to access to the IP services described on the following chapters. The AT+KCNXCFG command is only defined to set the current parameters. The defined connection will be automatically opened when needed by the IP services. (e.g. UDP service)

13.2.2. +KCNXTIMER: Connection Timer Configuration

AT+KCNXTIMER : Connection Timer Configuration	
Test command Syntax **AT+KCNXTIMER=?**	Response **+KCNXTIMER:** (list of supported **<cnx cnf>**s),(list of supported **<tim1>**s),(list of supported **<nbtrial>**s),(list of supported **<tim2>**s) **OK**
Read command Syntax **AT+KCNXTIMER?**	Response **+KCNXTIMER: <cnx cnf>,<tim1>,<nbtrial>,<tim2>[<CR><LF>** **+KCNXTIMER: <cnx cnf>, <tim1>,<nbrtrial>,<tim2>[…]]** **OK**
Write command Syntax **AT+KCNXTIMER=<cnx cnf>[,[<tim1>][,[<nbrtrial>][,<tim2>]]]**	Response **OK** Parameters **<cnx cnf>:** [0..7] (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration **<tim1>:** 1 - 120s (30s by default) If module fails to activate the PDP context, a timer of <tim1> will be started. When this timer expires, it will try to activate the PDP context again.

AT+KCNXTIMER : Connection Timer Configuration	
	<nbtrial>: Attempt times from1-4 (2 by default) Module will try to activate the PDP context with max **<nbtrial>** *Write command* Syntax **AT+KCNXTIMER=<cnx cnf>[,[<tim1>][,[<nbrtrial>][,<tim2>]]]]**attempts and with an interval of **<tim1>** **<tim2>:** 0 - 300s (60s by default). 0: deactivated (connection will not close by itself) When module as a client, module will try to connect to server within **<tim2>**s, if **<tim2>** expires, it will give up the connection.
Reference Sierra Wireless Proprietary	Notes • This command will only have impact on TCP/UDP specific commands (+KTCPCNX, +KTCPSTART, +KUDPCFG)

13.2.3. +KCNXPROFILE: Current Profile Connection Configuration

AT+KCNXPROFILE : Current profile connection configuration	HiLoV2 HiAll only
Read command Syntax **AT+KCNXPROFILE?**	Response **+KCNXPROFILE: <cnx cnf>** **OK**
Write command Syntax **AT+KCNXPROFILE=** **<cnx cnf>**	Response **OK** Parameters **<cnx cnf>:** [0..7] (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration
Reference Sierra Wireless Proprietary	Notes • The current profile will be overridden after KTCPCNX, KUDPCFG, etc. with specified **<cnx cnf>**

13.2.4. +KCGPADDR: Display PDP Address

AT+KCGPADDR : Display PDP address	**HiLoV2 HiAll only**
Write command Syntax **AT+KCGPADDR**	Response **+KCGPADDR: <cnx cnf>, <PDP_addr>** **OK** Parameters, **<cnx cnf>:** [0..7] (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration **< PDP_addr >:** a string that identifies the MT in the address space applicable to the PDP
Reference Sierra Wireless Proprietary	Notes • This AT command can be used after KTCPCNX, KUDPCFG, etc. to display the local IP address of the module

13.2.5. +CGPADDR Command: Display PDP Address

AT+CGPADDR : Display PDP address	**HiLo3G HiLoNC3GPS**
Test command Syntax **AT+CGPADDR=?**	Response **+CGPADDR:** (list of supported **<cid>**s) **OK**
Write command Syntax **AT+CGPADDR=<cid>[,<cid>,[…]]**	Response **+CGPADDR: <cid>, <PDP_addr>** **[+CGPADDR: <cid>, <PDP_addr>** **[…]]** **OK** Parameters **< PDP_addr >:** a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address> is omitted if none is available. "<n>.<n>.<n>.<n>" where <n>=0..255 **<cid>:** 1..2
Reference [27.007] §10.1.14	Notes • The execution command returns a list of PDP addresses for the specified context identifiers • Example : Ask for IP address according to cid=1 (identify the PDP context) AT+CGPADDR=1 +CGPADDR: 1, “10.20.30.40”

13.3. End of Data Pattern

13.3.1. +KPATTERN: Custom End Of Data Pattern

AT+KPATTERN : Custom End Of Data pattern	
Read command Syntax **AT+KPATTERN?**	 Response **+KPATTERN: <EOF pattern>** **OK**
Write command Syntax **AT+KPATTERN =** **<EOF pattern>**	 Response **OK** **+CME ERROR <err>** Parameters **<EOF pattern>:** String type (max size 128 bytes). This is a pattern used to notify the end of data (or file) during data or file transfer This string doesn't have to be human-readable (Not printable characters are allowed)
Reference Sierra Wireless Proprietary	Notes • The default value of the pattern is: "--EOF--Pattern—" • It is the responsibility of the user to select an appropriate pattern according to the data transferred. (i.e. Numeric pattern for text files and Readable string for binary files)

13.4. TCP Specific Commands

13.4.1. +KTCPCFG: TCP Connection Configuration

AT+KTCPCFG : TCP Connection Configuration	
Test command Syntax **AT+KTCPCFG=?**	 Response **+KTCPCFG:** (list of possible **<mode>**s) **OK**
Read command Syntax **AT+KTCPCFG?**	 Response **+KTCPCFG: <session_id>,<status>,<cnx cnf>,<mode>[,<serverID>],<tcp remote address>,<tcp_port>,[source_port],<data_mode>,<URC-ENDTCP-enable><CR><LF>** **+KTCPCFG: <session_id>,<status>,<cnx cnf>,<mode>[,<serverID>],<tcp remote address>,<tcp_port>,[source_port>],<data_mode>,<URC-ENDTCP-enable>[…]]**
Write command Syntax **AT+KTCPCFG=[<cnx cnf>],<mode>,[<tcp remote address>],<tcp_port>[,[<source_port>][,[<data_mode>],[<URC-ENDTCP-enable>]]]**	 Response **+KTCPCFG: <session_id>** **OK**

AT+KTCPCFG : TCP Connection Configuration	
Write command Syntax **AT+KTCPCFG=[<cnx cnf>],<mode>,[<tcp remote address>],<tcp_port>[,[<source_port>][,[<data_mode>],[<URC-ENDTCP-enable>]]]**	Parameters **<cnx conf>:** Index of a set of parameters for configuring one TCP session (see KCNXCFG) **<session_id>:** Index of the TCP session **<mode>:** 0: Client 1: Server (not supported by HiLo3G and HiLo3GPS) 2: Child (Generated by server sockets) (not supported by HiLo3G and HiLo3GPS) **<tcp remote address>:** Dot-separated numeric (0-255) parameters on the form a1.a2.a3.a4 or explicit name of the remote server. For server configuration, this parameter is left blank **<tcp_port>:** Numeric parameter (0-65535) **<status>:** Connection state of the selected socket (0-1) respectively (disconnected - connected) **<serverID>:** Index of the server session ID. Only for socket in mode CHILD **<source_port>:** Numeric parameter (0-65535). Specify the local TCP client port number **<data_mode>:** **For HiLo V2 and HiAll NC only** 0: Do not display <data> in URC (Default setting) 1: Display <data> in URC **<URC-ENDTCP-enable>:** **For HiLo V2 and HiAll NC only** 0: Do not display URC "+KTCP_ACK" (Default setting) 1: Display URC "+KTCP_ACK"
Reference Sierra Wireless Proprietary	Notes • If the socket is defined as a **<CLIENT>** socket, **<tcp_port>** and **<tcp remote address>** define the port and the IP address of the remote server we want to connect • Maximum **<session_id>** is 200 • **HiLo3G** and **HiLoNC3GPS** only support 1 session • **HiLo3G** and **HiLoNC3GPS** do not support server mode **For HiLo V2 and HiAll NC only:** • For child session, the property <data_mode> will be kept the same as the server socket's setting • See **Appendix 18.6.6** for use cases of AT+KTCPACKINFO and <URC-ENDTCP-enable> option of AT+KTCPCFG

13.4.2. +KTCPCNX: TCP Connection

AT+KTCPCNX : TCP Connection	
Write command Syntax **AT+KTCPCNX=<session_id>**	Response **OK** **NO CARRIER** **+CME ERROR: <err>** **+KTCP_NOTIF: <session_id>, <tcp_notif>**

AT+KTCPCNX : TCP Connection	
Write command Syntax **AT+KTCPCNX=** **<session_id>**	Parameters **<session_id>:** Index of the TCP session **<tcp_notif>:** Integer type. Indicates the cause of the TCP connection failure 0- Network error 1- No more sockets available; max. number already reached 2- Memory problem 3- DNS error 4-TCP disconnection by the server or remote client 5-TCP connection error 6- Generic error 7- Fail to accept client request's 8- Data sending is OK but KTCPSND was waiting more or less characters 9- Bad session ID 10- Session is already running 11- All sessions are used
Reference Sierra Wireless Proprietary	Notes • This command is used for connecting to a remote server or listening to a bound port, depends on the selected mode of <**session_id.>** • When more than two different APN are used in +KCNXCFG, only one of them can be used in TCP or UDP services

13.4.3. +KTCPRCV: Receive Data through a TCP Connection

AT+KTCPRCV : Receive data through a TCP connection	
Write command Syntax **AT+KTCPRCV=** **<session_id>,<ndata>**	Response **CONNECT** **…<EOF pattern>** **OK** **+KTCP_NOTIF: <session_id>,<tcp_notif>** Parameters **<session_id>:** Index of the TCP session. **<ndata>:** Number of bytes the device wants to receive (max value 4294967295) **<tcp_notif>:** See command AT+KTCPCNX
Reference Sierra Wireless Proprietary	Notes • This function is used to receive **<ndata>** data bytes through a previously opened TCP socket • **<ndata>** indicates the max data number that the terminal wishes to receive. If the TCP socket contains more data than **<ndata>** bytes then only **<ndata>** bytes will be received. If the TCP socket contains less data than **<ndata>** bytes then only TCP socket's data will be received • **<EOF pattern>** would be added at the end of data automatically • When **<ndata>** (max value) bytes or only available data in the TCP socket have been received, the module returns to command state and returns OK • Before using this command, it is highly recommended to configure the module for Hardware flow control, using the command **AT&K3** • The behavior of DTR drop meets with **AT&D**

13.4.4. +KTCPSND: Send Data through a TCP Connection

AT+KTCPSND : Send data through a TCP connection	
Write command Syntax **AT+KTCPSND=** **<session_id>,<ndata>**	 Response **CONNECT** **OK** Error case **NO CARRIER** **+CME ERROR: <err>** **+KTCP_NOTIF: <session_id>,<tcp_notif>** Parameters **<session_id>:** Index of the TCP session **<ndata>:** Number of bytes (max value 4294967295) **<tcp_notif>:** See command AT+KTCPCNX
Reference Sierra Wireless Proprietary	Notes • User must use **<EOF pattern>** to finish sending, then module returns to command mode. • All the data will be sent out ignoring **<ndata>**. If data sent is not equal to **<ndata>** then **KTCP_NOTIF** would appear. • **<ndata>** is the data size without **<EOF pattern>** • Before using this command, it is highly recommended to configure the module for Hardware flow control, using the command **AT&K3** • The behavior of DTR drop meets with **AT&D** • Using **"+++"** can abort sending data and using **ATO[n]** to return back to data mode

13.4.5. +KTCPCLOSE: Close Current TCP Operation

AT+KTCPCLOSE : Close current TCP operation	
Write command Syntax **AT+KTCPCLOSE=** **<session_id>,<closing_type>**	 Response **OK** **+CME ERROR: <err>** **NO CARRIER** **+KTCP_NOTIF: <session_id>, <tcp_notif>** Parameters **<session_id>:** Index of the TCP session. **<closing_type>:** 0: abort. Fast closing of the TCP connection (NOT SUPPORT). 1: The TCP connection is properly closed, which means that data sent to the module by AT+KTCPSND will be sent to the TCP server and acknowledged before the socket is closed. **<tcp_notif>:** See command AT+KTCPCNX
Reference	Notes • This function first closes the TCP socket and if there is no other session

AT+KTCPCLOSE : Close current TCP operation	
Sierra Wireless Proprietary	running then the PDP context is released • You can use AT+KTCPDEL=<session_id> to delete the socket configuration after close

13.4.6. +KTCPDEL: Delete a Configured TCP Session

AT+KTCPDEL : Delete a configured TCP session	
Write command Syntax **AT+KTCPDEL=** **<session_id>**	 Response **OK** **+CME ERROR: <err>** **+KTCP_NOTIF: <session_id>, <tcp_notif>** Parameters **<session_id>:** Index of the TCP session **<tcp_notif>:** See command AT+KTCPCNX
Reference Sierra Wireless Proprietary	Notes • The session must be closed (KTCPCLOSE) before use of this command

13.4.7. +KTCP_SRVREQ Notification: Incoming Client Connection Request

+KTCP_SRVREQ : Notification: Incoming client's connection request	HiLoV2 HiAll only
Unsolicited notification	 Response **+KTCP_SRVREQ: <session_id>,<subsession_id>,client_ip>,<client_port>** Parameters **<session_id>:** Index of the TCP session **<subsession_id>:** Index of the newly created TCP session **<client_ip>:** Dot-separated numeric (0-255) parameters on the form a1.a2.a3.a4, the ip address of the incoming client **<client_port>:** Numeric parameter (0-65535), the port of the incoming client
Reference Sierra Wireless Proprietary	Notes • This notification is sent when a client requests a connection to the server. The connection is automatically accepted • The created session is driven as any other TCP session with its own session ID. Use KTCPSND, KTCPRCV, KTCPCLOSE, etc. to provide the service associated to this TCP server • The TCP server corresponding to the session ID is still able to receive connection requests from other clients. These requests are notified with KTCP_SRVREQ • The client ip address and port can also be checked by "AT+KTCPCFG?" after client is connected to HiLo TCP server
	• Configure HiLo to TCP servers AT&K3+KCNXCFG=0,"GPRS","szsjmc.gd";+KTCPCFG=0,1,,179

+KTCP_SRVREQ : Notification: Incoming client's connection request	HiLoV2 HiAll only
	+KTCPCFG: 1 OK AT&K3+KCNXCFG=0,"GPRS","szsjmc.gd";+KTCPCFG=0,1,,180 +KTCPCFG: 2 OK • Start the TCP servers AT+KTCPCNX=1 ---- listen on the port 179 OK AT+KTCPCNX=2 ---- listen on the port 180 OK • Show the HiLo TCP servers' ip address AT+KCGPADDR +KCGPADDR: 0,"192.168.1.49" OK • Incoming connection request from remote client, shows ip address and port of remote client +KTCP_SRVREQ: 1,3,"192.168.0.32",4614 ---- incoming a connection request from "192.168.0.32" via HiLo listening port 179, the remote port is 4614 +KTCP_SRVREQ: 2,4,"10.10.10.110",4665 ---- incoming a connection request from "10.10.10.110" via HiLo listening port 180, the remote port is 4665 +KTCP_SRVREQ: 2,5,"10.10.10.110",4668 ---- incoming a connection request from the same ip via the same HiLo listening port, the remote port is 4668 +KTCP_SRVREQ: 1,6,"192.168.1.117",1739 ---- incoming a connection request from "192.168.1.117" via HiLo listening port 179, the remote port is 1739 +KTCP_NOTIF: 4,4 ---- the connection of sub session id 4 (on HiLo listening port 180) is closed. +KTCP_SRVREQ: 2,4,"10.10.10.8",4672 ---- incoming a connection request from "10.10.10.8" via HiLo listening port 180, the remote port is 4672

13.4.8. +KTCP_DATA: Incoming Data through a TCP Connection

+KTCP_DATA : Incoming data through a TCP Connection	**HiLoV2 HiAll only**
Unsolicited notification	Response **+KTCP_DATA: <session_id>,<ndata available>[,<data>]<CR><LF>** Parameters **<session_id>:** Index of the TCP session **<ndata available>:** Maximum number of bytes to be read **<data>:** Data in octet. The length of data is specified by <ndata_available>
Reference Sierra Wireless Proprietary	Notes • As soon as the connection is established, the module can receive data through the TCP socket. This notification is sent when data are available in the receive buffer • This notification is sent for each TCP packet received • When <data_mode> was set to 1, <ndata_available> will range 1~1500 in the URC. If user application sent over 1500 bytes data to module, module will display those data with several URC • See Appendix 18.8.3 Use cases for KTCP_DATA and KUDP_DATA

13.4.9. +KTCP_DATA Notification: Incoming data through a TCP Connection

+KTCP_DATA : Notification: Incoming data through a TCP Connection
Unsolicited notification	Response **+KTCP_DATA: <session_id>,<ndata available>** Parameters **<session_id>:** Index of the TCP session **<ndata available>:** Maximum number of bytes to be read
Reference Sierra Wireless Proprietary	Notes • As soon as the connection is established, the module can receive data through the TCP socket. This notification is sent when data are available in the receive buffer • This notification is sent for each TCP packet received

13.4.10. +KURCCFG: Enable or Disable the URC from TCP Commands

AT+KURCCFG : Enable or disable the URC from TCP commands	**HiLoV2 HiAll only**
Test command Syntax **AT+KURCCFG=?**	 Response **+KURCCFG: (list of supported <protocol>),(list of supported <active>)** **OK**
Read command Syntax **AT+KURCCFG?**	 Response **+KURCCFG: list of supported (<protocol>,<active>)** **OK**
Write command Syntax **AT+KURCCFG= <protocol>,<active>**	 Response **OK** Parameters **<protocol>:** "TCP" only **<active>:** 1 enable URC 0 disable URC
Reference Sierra Wireless Proprietary	Notes • Enable/Disable +KTCP_NOTIF unsolicited messages, this is useful to use only a polling mode with +KTCPSTAT • If "disable" : URC are discarded and not stored • Can be used in 07.10 multiplexer Example : To disable URC: AT+KURCCFG=”TCP”,0 OK Test and read command: AT+KURCCFG=? +KURCCFG: (”TCP”),(0,1) OK AT+KURCCFG? +KURCCFG: (”TCP”,0) OK

13.4.11. +KTCPSTAT: Get TCP Socket Status

AT+KTCPSTAT : Get TCP socket status	**HiLoV2 HiAll only**
Test command Syntax **AT+KTCPSTAT=?**	 Response **OK**

AT+KTCPSTAT : Get TCP socket status	HiLoV2 HiAll only
Read command Syntax **AT+KTCPSTAT?**	 Response **OK**
Write command Syntax **AT+KTCPSTAT=<session_id>**	 Response **+KTCPSTAT : <status>,<tcp_notif>,<rem_data>,<rcv_data>** **OK** Parameters **<session_id>:** Index of the TCP session **<status>:** value to indicate TCP socket state : 0 socket not defined, use KTCPCFG to create a TCP socket 1 socket is only defined but not used 2 socket is opening and connecting to the server, cannot be used 3 connection is up, socket can be used to send/receive data 4 connection is closing, it cannot be used, wait for status 5 5 socket is closed **<tcp_notif>:** -1 if socket/connection is OK , <tcp_notif> if an error has happened **<rem_data>:** remaining bytes in the socket buffer, waiting to be sent **<rcv_data>:** received bytes, can be read with +KTCPRCV command
Reference Sierra Wireless Proprietary	Notes • Size of socket's buffer is 1460 BYTES

13.4.12. +KTCPSTART: Start a TCP Connection in Direct Data Flow

AT+KTCPSTART : Start a TCP connection in direct data flow	HiLoV2 HiAll only
Test command Syntax **AT+KTCPSTART=?**	 Response **OK**
Read command Syntax **AT+KTCPSTART?**	 Response **OK**

AT+KTCPSTART : Start a TCP connection in direct data flow	**HiLoV2 HiAll only**
Write command Syntax **AT+KTCPSTART=<session_id>**	Response **CONNECT** **OK** **+CME ERROR : an error occurs, syntax error** **+KTCP_NOTIF: <session_id>,<tcp_notif> : an error occurs** Parameters **<session_id>:** Index of the TCP session **<tcp_notif>:** See command AT+KTCPCNX
Reference Sierra Wireless Proprietary	Notes • This function is used to send and receive data bytes through a TCP socket • Before using this command, it is highly recommended to configure the module for Hardware flow control, using the command **AT&K3** • The behavior of DTR drop meets with **AT&D** • **+++** can be used to switch in command mode • **ATO<session_id>** can be used to switch back in data mode • Only 1 KTCPSTART session can be used • Can be used in 07.10 multiplexer

13.4.13. +KTCP_ACK: Status Report for Latest TCP Data

+KTCP_ACK : Status report for latest TCP data	**HiLoV2 HiAll only**
Unsolicited notification	Response **+KTCP_ACK: <session_id>,<result>CR><LF>** Parameters **<session_id>:** Index of the TCP session **< result>:** 0: Data sent failure: not all data has been received by remote side 1: Data sent success: all the data has already been received by the remote side
Reference Sierra Wireless Proprietary	Notes • This URC is enabled or disabled by parameter <URC-ENDTCP-enable> of command “”+KTCPCFG”. The URC is disabled by default • See Appendix 18.6.6 Use cases for AT+KTCPACKINFO and <URC-ENDTCP-enable> option

13.4.14. +KTCPACKINFO: Poll ACK Status for the Latest Data

+KTCPACKINFO : Poll ACK status for the latest data	**HiLoV2 HiAll only**
Write command Syntax **AT+KTCPACKINFO= <session_id>**	Response **+KTCPACKINFO: <session_id>,<result>** **OK** **+CME ERROR: <err>** Parameters **<session_id>:** Index of the TCP session **<result>:** 0: Data sent failure: not all data has been received by remote side. 1: Data sent success: all the data has already been received by the remote side 2: The status is unknown yet
Reference Sierra Wireless Proprietary	Notes • The command will return ERROR if <URC-ENDTCP-enable> of command “+KTCPCFG” is 0 • Before the first AT+KTCPSND of the session, AT+KTCPACKINFO returns 2

13.5. FTP Client Specific Commands

13.5.1. +KFTPCFG: FTP Configuration

AT+KFTPCFG : FTP Configuration	
Read command Syntax **AT+KFTPCFG?**	 Response **+KFTPCFG: <cnx cnf>,<server_name>,<login>,<password>,<port_number>,<mode>**
Write command Syntax **AT+KFTPCFG=[<cnx cnf>],<server_name>[,<login>[,<password>[,<port_number> [,<mode>]]]]**	 Response **+KFTPCFG:<session_id>** **OK** Parameters **<cnx cnf>:** [0..7] (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration **<session_id>:** Index of the FTP session **<server_name>:** string type. Consists of a dot-separator numeric (0-255) parameters on the form a1.a2.a3.a4, to identify the ftp server or domain name of the server **<login>:** string type, indicates the user name to be used during the FTP connection **<password>:** string type, indicates the password to be used during the FTP connection **<port_number>:** numeric parameter (0-65535). Indicates the remote command port (21 by default) **<mode>:** numeric number. Indicates the initiator of the FTP connection. 0 – active The server is initiator of the FTP data connection 1 – passive The client is initiator of the FTP data connection in order to avoid the proxy filtrate. The passive data transfer process “listens” on the data port for a connection from the active transfer process in order to open the data connection Note that only passive mode is currently supported, active mode is internally switched to passive
Reference Sierra Wireless Proprietary	Notes • Execution command sets the server name, the login, the password, the port number and the mode for ftp operations • Only one ftp session is currently supported, <session_id> is always 0 Example : AT+KFTPCFG=0,"ftp.connect.com","username","password",21,0

13.5.2. +KFTPRCV: Receive FTP Files

AT+KFTPRCV : Receive FTP files	
Write command Syntax **AT+KFTPRCV=<session_id>,[<local_uri>,][<server_path>,]<file_name>[,<type_of_file>[,<offset>]]**	Response **CONNECT** **<EOF_pattern> | OK** **OK** **+CME ERROR<err> | +KFTP_RCV_DONE: <session_id>** **NO CARRIER** **+KFTP_ERROR :<session_id>, <ftp cause>** Parameters **<session_id>:** Index of the FTP session **<local_uri>:** String type. Indicates the URI of the destination file. It shall start with "/". An empty string or no string indicates that the data will be transmitted to the serial link in data mode - CONNECT/OK. If this string is present, the file will be silently downloaded to this destination, as the download is finish the module notifies the user - +KFTP_RCV_DONE **<server_path>:** string type. Indicates the path of the file to be downloaded. An empty string or no string indicates the downloading is done from the path given by the <server_name> parameter **<file_name>:** string type. Indicates the name of the file to download **<type_of_file>:** Numeric type. Indicates the type of file (ASCII or binary) to transfer 0 – binary, (default value) 1 – ASCII **<offset>:** Integer type(0-4294967295). Indicates the offset to "resume transfer". See Appendix 18.7.3"FTP Resume" use case When downloading file and transmitting to serial link, module will use the <offset> value and "resume transfer" from this position. When downloading file to flash, the <offset> should be set to non-zero. Then the Module will automatically detect the real size of the file in file system. The real size will be used as the real <offset> for resuming transfer. **<EOF_pattern>:** End of file notification. See +KPATTERN for value **<ftp_cause>:** Integer type. Indicates the cause of the FTP connection failure. 0- the sending or the retrieving was impossible due to request timeout 1- it is impossible to connect to the server due to DNS resolution failure 2- it is impossible to download a file due to connection troubles. 3- the download was impossible due to connection timeout 4- no network available 5- flash access trouble 6- flash memory full XXX- three digits, reply codes from FTP server See Appendix 18.2.4FTP Reply

AT+KFTPRCV : Receive FTP files	
Reference Sierra Wireless Proprietary	Notes • Before using this command an FTP connection must have been achieved using AT+KFTPCFG • The only valid <local_uri> is "/filename" • After sending the +KFTPRCV command, the user will receive the entire data stream • The user can abort the downloading by sending any character from the host. In this case, the module will end the transfer by transmitting the EOF followed by ERROR • If set AT&D2, the user can terminate the downloading by turn DTR off, the module will return as follows: **NO CARRIER** • AT&D1 is not available for this command • +++ is not available for this command • If set AT&C1, DCD will be ON after CONNECT, and DCD will be OFF after download done • “Resume transfer” feature shall be supported by the FTP server to be used. • See Appendix 18.7.3"FTP Resume" use case • If the FTP server does not support the resume feature, module will output KFTP_ERROR. The <ftp_cause> will be in the sets {500, 501, 502, 421, 530}. See "Appendix 18.2.4 FTP Reply Codes" for those error codes

13.5.3. +KFTPSND: Send FTP Files

AT+KFTPSND : Send FTP files	
Write command Syntax **AT+KFTPSND=<session_id>,[<local_uri>,][<server_path>,]<file_name>[,<type of file>][,<append>]**	Response **CONNECT** data … **| OK** <EOF pattern> **OK | +KFTP_SND_DONE: <session_id>** **+CME ERROR <err>** **NO CARRIER** **+KFTP_ERROR : <session_id>,<ftp cause>** Parameters **<session_id>:** Index of the FTP session **<local_uri>:** String type. Indicates the URI of the file to upload. An empty string or no string indicates that the data will be transmitted to the serial link in data mode - CONNECT/OK. If this string is present, the file will be silently uploaded to this destination, as the upload is finish the module notifies the user - +KFTP_SND_DONE **<server_path>:** string type. Indicates the path of the file to be uploaded. An empty string or no string indicates the uploading is done from the path given by the **<server_name>** parameter **<file_name>:** string type. Indicates the name of the file to upload

AT+KFTPSND : Send FTP files	
	<type of file>: Numeric type. Indicates the type of file (ASCII or binary) to transfer 0 – binary, (default value) 1 – ASCII <**append>:** Numeric type. Indicates using "append" or not when uploading. 0 – Do not use "append". (default value) If the file already exists then the file will be overridden 1 – Use "append". If the file already exists then the data will be appended at the end of the file; otherwise the file will be created **<EOF pattern>:** End of file notification. See KPATTERN for value **<ftp_cause>:** Integer type. Indicates the cause of the FTP connection failure 0- the sending or the retrieving was impossible due to request timeout 1- it is impossible to connect to the server due to DNS resolution failure 2- it is impossible to upload a file due to connection troubles 3- the upload was impossible due to connection timeout 4- no network available 5- flash access trouble XXX - three digits, reply codes from FTP server. See Appendix A2.4 FTP Reply Codes
Reference Sierra Wireless Proprietary	Notes • Before using this command an FTP connection must have been achieved using AT+KFTPCFG • The only valid <local_uri> is "/filename" • After sending the +KFTPSND command, the host must send the entire data stream of the file • If set AT&D2, the user can terminate the uploading by turn DTR off, the module will return as follows: **NO CARRIER** • AT&D1 is not available for this command • ATO is not available for this command • If set AT&C1, DCD will be ON after CONNECT, and it will be OFF after upload done

13.5.4. +KFTPDEL: Delete FTP Files

AT+KFTPDEL : Delete FTP files	
Write command Syntax **AT+KFTPDEL=<session_id>,[<server_path>,]<file_name>[, <type>]**	 Response **OK** **+CME ERROR <err>** **NO CARRIER** **+KFTP_ERROR : <session_id>,<ftp cause>**

AT+KFTPDEL : Delete FTP files	
Write command Syntax **AT+KFTPDEL=<session_id>,[<server_path>,]<file_name>[, <type>]**	Parameters **<session_id>:** Index of the FTP session **<server_path>:** string type. Indicates the path of the file to be deleted. An empty string or no string indicates the deleting is done from the path given by the <server_name> parameter **<file_name>:** string type. Indicates the name of the file to delete **<type>:** Numeric type. Indicates the type of file (ASCII or binary) to transfer 0 – binary, (default value) 1 – ASCII **<ftp_cause>:** Integer type. Indicates the cause of the FTP connection failure 0- the sending or the retrieving was impossible due to request timeout 1- it is impossible to connect to the server due to DNS resolution failure 2- it is impossible to delete a file due to connection troubles 3- the deleting was impossible due to connection timeout 4- no network available xxx- three digits, reply codes from FTP server See Appendix A2.4 FTP Reply Codes
Reference Sierra Wireless Proprietary	Notes • Before using this command an FTP connection must have been achieved using AT+KFTPCFG

13.5.5. +KFTPCLOSE: Close Current FTP Connection

AT+KFTPCLOSE : Close current FTP connection	
Write command Syntax **AT+KFTPCLOSE=<session_id>**	Response **OK** Parameters **<session_id>:** Index of the FTP session
Reference Sierra Wireless Proprietary	Notes • This command will close the connection to the FTP server

13.6. FTP Server Specific Commands

13.6.1. +KFTPDCFG: FTP Server Configuration

<table>
<tr><th colspan="2">AT+KFTPDCFG : FTP Server Configuration HiLoV2 HiAll only</th></tr>
<tr><td>Read command

Syntax
AT+KFTPDCFG?</td><td>

Response
+KFTPDCFG: <cnx cnf>,<mode>,<root fs>,<password>,<port number>
OK</td></tr>
<tr><td>Write command

Syntax
AT+KFTPDCFG=[<cnx cnf >,]<mode>,<root fs>,<password>[,<port number>]</td><td>

Response
OK

Parameters
<cnx cnf>: [0..7] (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration
<root fs>: Root directory of the assigned to the FTP server.
<password>: String type, indicates the password to be used during the FTP connection.
<port number>: numeric parameter (0-65535). Indicates the remote command port (21 by default)
<mode>: numeric number. Indicates the initiator of the FTP connection.
0 – active. The server is initiator of the FTP data connection
1 – passive. The client is initiator of the FTP data connection in order to avoid the proxy filtrate. The passive data transfer process “listens” on the data port for a connection from the active transfer process in order to open the data connection.
Note that only passive mode is currently supported, active mode is internally switched to passive</td></tr>
<tr><td>Reference
Sierra Wireless Proprietary</td><td>Notes
• Execution command configures the server. See KFTPDRUN for server activation
• Only one ftp server session is currently supported
• The only valid <root fs> is "/ftp"
• When login the ftp server, only password is required, username is not required</td></tr>
</table>

13.6.2. +KFTPDSTAT: FTP Server Status

AT+KFTPDSTAT : Get FTP Server Status	**HiLoV2 HiAll only**
Read command Syntax **AT+KFTPDSTAT?**	Response **+KFTPDSTAT: <state>,<nb_users>,<notif>** **OK** Parameters **<state>:** Status of the server 0 – Deactivated. The FTP service is not available 1 – Activated. The FTP service is ready **<nb_users>:** Number of users currently connected **<notif>:** Activation of unsolicited notification KFTPD_NOTIF 0 – disable. Event of the server are not sent to V24 1 – Enable. Event of the server are sent to V24 with KFTPD_NOTIF
Write command Syntax **AT+KFTPDSTAT=<notif>**	Response **OK** Parameters **<notif>:** Activation of unsolicited notification KFTPD_NOTIF 0 – disable. Event of the server are not sent to V24 1 – Enable. Event of the server are sent to V24 with KFTPD_NOTIF
Reference Sierra Wireless Proprietary	Notes • Execution command configures the server. See KFTPDRUN for server activation • Only one ftp user is currently supported, <nb_users> is always 0

13.6.3. +KFTPDRUN: Run FTP Server

AT+KFTPDRUN : Run FTP server	**HiLoV2 HiAll only**
Write command Syntax **AT+KFTPDRUN=<notif>**	Response **+KFTPDRUN:<server ip>** **OK** **+CME ERROR <err>** **NO CARRIER** **+KFTPD_ERROR : <ftpd cause>** Parameters **<server ip>:** IP address of the ftp server **<notif>:** Activation of unsolicited notification KFTPD_NOTIF 0 – disable. Event of the server are not sent to V24 1 – Enable. Event of the server are sent to V24 with KFTPD_NOTIF **<ftpd_cause>:** Integer type. Indicates the cause of the FTP connection failure 0- Not enough resource available 1- No network available
Reference Sierra Wireless Proprietary	Notes • When the command returns OK, the server is activated and ready for FTP clients. Status of the server can be monitored with KFTPDSTAT • The kick out timer is defined by parameter **<tim1>** in **AT+KCNXTIMER**

13.6.4. +KFTPD_NOTIF Notification: Server Event Notification

+KFTPD_NOTIF Notification: Server event notification	**HiLoV2 HiAll only**
Unsolicited notification	Response **+KFTPD_NOTIF: <event>, <client ip>[,<uri>]** Parameters **<event>:** 0 – Incoming connection from client <*ip*> 1 – The client <*ip*> is uploading the file <*uri*> 2 – The client <*ip*> is downloading the file <*uri*> 3 – The client <*ip*> is deleting the file <*uri*> 4 – Disconnection from client <*ip*> **<ip>:** IP address of the client that is responsible of the event **<uri>:** File concerned by the event (Only notification 1-3)
Reference Sierra Wireless Proprietary	Notes • These notifications can be disabled, the server still runs in silent mode

13.6.5. +KFTPDKICK: Kick User from FTP Server

AT+KFTPDKICK : Kick user from FTP server	**HiLoV2 HiAll only**
Write command Syntax **AT+KFTPDKICK=<ip>**	 Response **OK** Parameters **<ip>:** IP address of the client to disconnect
Reference Sierra Wireless Proprietary	Notes • The client is only kicked from the server, not banned. He will be able to request another connection to the server. A blacklist of users and IP addresses could be added in a future evolution

13.6.6. +KFTPDCLOSE: Close FTP Server

AT+KFTPDCLOSE Close FTP server	**HiLoV2 HiAll only**
Write command Syntax **AT+KFTPDCLOSE**	 Response **OK**
Reference Sierra Wireless Proprietary	Notes • This command will close the FTP server

13.7. UDP Specific Commands

13.7.1. +KUDPCFG: UDP Connection Configuration

AT+KUDPCFG : UDP connection configuration	
Read command Syntax **AT+KUDPCFG?**	 Response **+KUDPCFG: <session_id>,<cnx cnf>,<mode>,<port>,<data_mode><CR><LF>** **+KUDPCFG: <session_id>,<cnx cnf>,<mode>,<port>,<data_mode>[…]]** **OK**
Write command Syntax **AT+KUDPCFG=** **<cnx cnf>,<mode>[,[<port>][,<data_mode>]]**	 Response **+KUDPCFG: <session_id>** **OK** Error case **NO CARRIER** **+CME ERROR: <err>** **+KUDP_NOTIF: <session_id>, <udp_notif>** Parameter **<session_id>:** Index of the UDP session. **<mode>:** 0: Client 1: Server **<port>:** Numeric parameter (0-65535). **<cnx cnf>:** [0..7] (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see +KCNXCFG). **<udp_notif>:** Integer type. Indicates the cause of the UDP connection failure. 0-Network error 1-no more sockets available; max number already reached 2-Memory problem 3-DNS error 5-UDP connection error(Host unreachable) 6-generic error 8-Data sending is OK but KUDPSND was waiting more or less characters 9-Bad session ID 10-Session is already running 11-All sessions are used **<data_mode>:** 0: Do not display <data> in URC (Default setting) 1: Display <data> in URC

AT+KUDPCFG : UDP connection configuration	
Reference Sierra Wireless Proprietary	Notes • For UDP socket in server mode, it is bound to a defined port number, incoming connection are notified by KUDP_DATA • Maximum **<session_id>** is 200 • When more than two different APN are used in +KCNXCFG, only one of them can be used in TCP or UDP services • For HiLo3G and HiLoNC3GPS when more than two different APN are used in +KCNXCFG, only one of them can be used in TCP or UDP services • **HiLo3G** and **HiLoNC3GPS** only support 1 session • **HiLo3G** and **HiLoNC3GPS** do not support server mode

13.7.2. +KUDP_DATA: Incoming Data through a UDP Connection

+KUDP_DATA : Incoming data through a UDP Connection	
Unsolicited notification	Response **+KUDP_DATA: <session_id>,<ndata available>[,<udp remote address>,<udp remote port>,<data>]<CR><LF>**
Unsolicited notification	Parameters **<session_id>:** Index of the UDP session **<ndata available>:** Number of bytes to be read **<udp remote address>:** Dot-separated numeric (0-255) parameters on the form a1.a2.a3.a4 **<udp remote port>:** Numeric parameter (0-65535) **<data>:** Data in octet. The length of data is specified by <ndata_available>.
Reference Sierra Wireless Proprietary	Notes • As soon as the UDP socket is created, the module can receive data through this socket. This notification is sent when data are available in the receive buffer • This notification will be sent one time. When <data_mode> was set to 0 (Do not display data in URC), the controlling software must read the buffer with KUDPRCV in order to activate the notification again • When <data_mode> was set to 1, <ndata_available> will range 1~1500 in the URC. In this case, user application should control the max-length of the UDP packet. The max-length should be less than 1500 bytes, or some data will be discarded • When <data_mode> was set to 1, URC “+KUDP_RCV” will not be displayed after “+KUDP_DATA” • When <data_mode> was set to 1, the fields <udp remote address> and <udp remote port> will be displayed in URC “+KUDP_DATA”. When <data_mode> was set to 0, they will be displayed in URC “+KUDP_RCV” • See Appendix 18.8.3 Use cases for KTCP_DATA and KUDP_DATA

13.7.3. +KUDPCLOSE: Close Current UDP Operation

AT+KUDPCLOSE : Close current UDP operation	
Action command Syntax **AT+KUDPCLOSE=** **<session_id>**	 Response **OK** **+KUDP_NOTIF: <session_id>, <udp_notif>** Parameters **<session_id>:** Index of the UDP session **<udp_notif>:** See command AT+KUDPCFG
Reference Sierra Wireless Proprietary	Notes • This function closes the UDP session. If there is no other session running, the PDP context would be released • This function will delete the session configuration also

13.7.4. +KUDPSND: Send Data through a UDP Connection

AT+KUDPSND : Send data through a UDP connection	
Write command Syntax **AT+KUDPSND=** **<session id>,<udp remote address>,<udp_port>, <ndata>**	 Response **CONNECT** **OK** Error case **NO CARRIER** **+CME ERROR: <err>** **+KUDP_NOTIF: <session_id>,< udp_notif>** Parameters **<session_id>:** Index of the UDP session **<udp remote address>:** dot-separated numeric (0-255) parameters on the form a1.a2.a3.a4 or explicit name of the remote server **<udp_port>:** numeric parameter (0-65535) **<ndata>:** number of bytes (max value 4294967295). In fact, only 1472 bytes can be sent successfully at one time. **<udp_notif>:** See command AT+KUDPCFG
Reference Sierra Wireless Proprietary	Notes • User must use **<EOF pattern>** to finish sending, then module returns to command mode • All the data will be sent out ignoring **<ndata>**. If data sent is not equal to **<ndata>** then **KUDP_NOTIF** would appear • **<ndata>** is the data size without **<EOF pattern>** • Before using this command, it is highly recommended to configure the module for Hardware flow control, using the command **AT&K3** • The behavior of DTR drop meet with **AT&D** • Using "+++" can abort sending data and using **ATO[n]** to return back to data mode

13.7.5. +KUDPRCV: Receive Data through a UDP Connection

<table>
<tr><th colspan="2">AT+KUDPRCV : Receive data through a UDP connection</th></tr>
<tr><td>Write command

Syntax
AT+KUDPRCV=
<session_id>,<ndata></td><td>

Response
CONNECT
…<EOF pattern>
OK
+KUDP_RCV: <udp remote address>,<udp remote port></td></tr>
<tr><td>Write command

Syntax
AT+KUDPRCV=
<session_id>,<ndata></td><td>
Error case
NO CARRIER
+CME ERROR: <err>
+KUDP_NOTIF: <session_id>, <udp_notif>
+KUDP_DATA_MISSED: <session_id>, <ndata missed>

Parameters
<session_id>: Index of the UDP session
<ndata>: Number of bytes the device wants to receive(max value 4294967295)
<udp remote address>: Dot-separated numeric (0-255) parameters on the form a1.a2.a3.a4
<udp remote port>: Numeric parameter (0-65535)
<udp_notif>: See command AT+KUDPCFG
<ndata missed>: Number of bytes left (and definitely lost!) in the UDP socket</td></tr>
<tr><td>Reference
Sierra Wireless Proprietary</td><td>Notes
• This function is used to receive <ndata> data bytes through a previously opened UDP socket
• <ndata> indicates the max data number that the terminal wishes to receive. If the UDP socket contains more data than <ndata> bytes then only <ndata> bytes will be received
• <EOF pattern> would be added at the end of data automatically
• When <ndata> (max value) bytes or only available data in the UDP socket have been received, the module returns to command mode
• Before using this command, it is highly recommended to configure the module for Hardware flow control, using the command AT&K3
• The behavior of DTR drop meet with AT&D</td></tr>
</table>

13.7.6. +KUDP_DATA Notification: Incoming Data through a UDP Connection

+KUDP_DATA: Notification: Incoming data through a UDP Connection	
Unsolicited notification	Response **+KUDP_DATA: <session_id>,<ndata available>** Parameters **<session_id>:** Index of the UDP session **<ndata available>:** Number of bytes to be read
Reference Sierra Wireless Proprietary	Notes • As soon as the UDP socket is created, the module can receive data through this socket. This notification is sent when data are available in the receive buffer • This notification will be sent one time. The controlling software must read the buffer with KUDPRCV in order to activate the notification again

13.8. SMTP Specific Commands

13.8.1. +KSMTPPARAM: Connection Configuration

AT+KSMTPPARAM : SMTP connection configuration	**HiLoV2 HiAll only**
Test command Syntax **AT+KSMTPPARAM=?**	 Response **+KSMTPPARAM: <server>, <port>, <sender>** **OK**
Read command Syntax **AT+KSMTPPARAM?**	 Response **+KSMTPPARAM: <server>, <port>, <sender>** **OK**
Write command Syntax **AT+KSMTPPARAM= <server>,<port>, <sender>**	 Response **OK** Parameters **<server>:** String type (max size 255 bytes). Indicates the basic name of the SMTP server. This name must either integrate SMTP URL schemes separate from the server name by "." or an IPV4 address e.g.: smtp.163.com or 123.125.50.135 **<port>:** Numeric type [0-65535]. Indicates the SMTP server port. **<sender>:** String type (max size 255 bytes). Indicates sender's mail address e.g.: mo200_xxx@163.com
Reference Sierra Wireless Proprietary	Notes • Usual SMTP default port is 25 • Between two emails sending, the <server > and <sender> fields are kept on inside the ME, therefore if the same identifier accesses the same SMTP server, those parameters do not need to be reloaded

13.8.2. +KSMTPPWD: Authentication Configuration

AT+KSMTPPWD : SMTP authentication configuration	**HiLoV2 HiAll only**
Test command Syntax **AT+KSMTPPWD=?**	 Response **+KSMTPPWD: <login>, <password>** **OK**
Read command Syntax **AT+KSMTPPWD?**	 Response **+KSMTPPWD: <login>, <password>** **OK**

AT+KSMTPPWD : SMTP authentication configuration	HiLoV2 HiAll only
Write command Syntax **AT+KSMTPPWD=** **<login>, <password>**	Response **OK** Parameters **<login>:** String type (max size 24 bytes). Indicates the user name to be used during the SMTP connection **<password>:** String type (max size 24 bytes). Indicates the password to be used during the SMTP connection
Reference Sierra Wireless Proprietary	Notes • If the dedicated SMTP server does not need authentication, <login> and <password> can be left empty • The SMTP client only supports LOGIN authentication • Between two emails sending, the <login> and <password> fields are kept on inside the ME, therefore if the same identifier accesses the same SMTP server, those parameters do not need to be reloaded

13.8.3. +KSMTPTO: Receivers Configuration

AT+KSMTPTO : SMTP receivers configuration	HiLoV2 HiAll only
Test command Syntax **AT+KSMTPTO=?**	Response **+KSMTPTO: <to1> [, <to2> [, <cc1> [, cc2>]]]** **OK**
Read command Syntax **AT+KSMTPTO?**	Response **+KSMTPTO: <to1> [, <to2> [, <cc1> [, cc2>]]]** **OK**
Write command Syntax **AT+KSMTPTO =** **<to1>[,<to2>[,<cc1>[, <cc2>]]]**	Response **OK** Parameters **<to1>:** String type. Indicates the name of the first receiver of the mail **<to2>:** String type. Indicates the name of the second receiver of the mail **<cc1>:** String type. Indicates the name of the first copy receiver of the mail **<cc2>:** String type. Indicates the name of the second copy receiver of the mail
Reference Sierra Wireless Proprietary	Notes • <to1>, <to2>, <cc1>, <cc2> strings max length 255 • These fields are deleted after each successful mail sent

13.8.4. +KSMTPSUBJECT: Subject Configuration

AT+KSMTPSUBJECT : SMTP subject configuration	**HiLoV2 HiAll only**
Test command Syntax **AT+KSMTPSUBJECT=?**	 Response **+KSMTPSUBJECT: <subject>** **OK**
Read command Syntax **AT+KSMTPSUBJECT?**	 Response **+KSMTPSUBJECT: <subject>** **OK**
Write command Syntax **AT+KSMTPSUBJECT= <subject>**	 Response **OK** Parameters **<subject>:** String type (max size 255 bytes). Indicates the subject of the mail. Must use US-ASCII charset
Reference Sierra Wireless Proprietary	Notes • This field is deleted after each successful mail sent • Must use US-ASCII charset

13.8.5. +KSMTPUL: Send Message

AT+KSMTPUL : Send SMTP message	**HiLoV2 HiAll only**
Test command Syntax **AT+KSMTPUL=?**	 Response **+KSMTPUL: <mode>, <size>** **OK**

AT+KSMTPUL : Send SMTP message	**HiLoV2 HiAll only**
Write command Syntax **AT+KSMTPUL=<mode>, <size>**	Response **+KSMTPUL: <session_id>** **CONNECT** The ME wait for the data to be sent **OK** **+CME ERROR: <err>** **NO CARRIER** Parameters **<mode>:** Numeric type. Indicates the transfer mode (header closed or not): **1-** Normal mode. The mail header is minimal, the user only send the mail body. This is use for simple mails without attachment **0-** Complex mode. The mail header minimal part is still handled by the AT command but the header is not closed. The user is responsible for completing and closing the mail header. This is use for mails with attachment or complex headers (cf. examples)
Write command Syntax **AT+KSMTPUL=<mode>, <size>**	**<size>:** Numeric type. Amount of data transferred within the CONNECT **<err>:** See 2.7 Error codes for the SMTP transfer **<session_id>:** Indicate the session id of current SMTP connection
Reference Sierra Wireless Proprietary	Notes • If the GSM or GPRS connection is not up, before uploading the file the ME will automatically open the predefined GSM or GPRS link • At the end of the SMTP transfer, whether it succeeds, the parameters associated with the current mail (recipients, subjects) will be set to the NULL value • Hardware flow control(AT&K3) is required for serial link • User can use **<EOF pattern>** to stop transfer. See AT+KPATTERN • The behavior of DTR drop meet with AT&D • Using “+++” can abort sending data and using ATO[n] to return back

13.8.6. +KSMTPCLEAR: Clear Parameters

AT+KSMTPCLEAR : Clear SMTP Parameters	**HiLoV2 HiAll only**
Action command Syntax **AT+KSMTPCLEAR**	Response **OK**
Reference Sierra Wireless Proprietary	Notes • This command deletes all SMTP parameters

13.8.7. Specific Error Codes for SMTP Commands

Code of <err>	Meaning
3000	Invalid SMTP server name
3001	Invalid address identification
3002	Invalid configuration. Parameter(s) is missing
3003	Invalid data size - with KSMTPUL
3004	SMTP session ID is not available
3010	The login or the password got an invalid value
3011	Invalid authentication method
3012	Invalid mail sender
3020	Invalid receivers of the mail TO1
3021	Invalid receivers of the mail TO2
3022	Invalid receivers of the mail CC1
3023	Invalid receivers of the mail CC2
3040	The SMTP transfer failed due to connection (GSM or GPRS) fails
3041	The SMTP transfer failed due to TCP connection troubles
3042	The SMTP transfer failed due to server TCP connection error
3043	The SMTP download failed due to Request time out
3044	The SMTP transfer failed due to SMTP protocol error
3045	The SMTP transfer failed due to DTR drop
3049	The SMTP transfer download failed due to internal error
3050	The SMTP transfer failed due to SMTP server trouble
3051	The SMTP transfer failed due to internal memory not available
3052	SMTP connection time out
3053	SMTP Raw Data upload to Module time out
3054	DNS Server address error or failed to resolve the host address
3055	SMTP client need Hardware flow control

13.9. POP3 Specific Commands

13.9.1. +KPOPCNX: Connection Configuration

AT+KPOPCNX : POP3 connection configuration	**HiLoV2 HiAll only**
Test command Syntax **AT+KPOPCNX=?**	 Response **+KPOPCNX: <server>, <port>, <login>, <password>** **OK**
Read command Syntax **AT+KPOPCNX?**	 Response **+KPOPCNX: <server>, <port>, <login>, <password>** **OK**
Write command Syntax **AT+KPOPCNX=** **<server>,<port>,<login>,** **<password>**	 Response **+KPOPCNX: <session_id>** **OK** Parameters **<server>:** String type (max size 255 bytes). Indicates the basic name of the POP3 server. This name must either integrate POP3 URL schemes separate from the server name by "." or an IPV4 address e.g.: pop.163.com or 123.125.50.29 **<port>:** Numeric type (0-65535). Indicates the POP3 server port **<login>:** String type (max size 24 bytes). Indicates the user name to be used during the POP3 connection **<password>:** String type (max size 24 bytes). Indicates the password to be used during the POP3 connection **<session_id>:** Indicate the session id of current POP3 connection
Reference Sierra Wireless Proprietary	Notes • Usual POP3 default port is 110 • Once the command returns OK, the module is connected to the POP3 server • This connection will be maintained until the KPOPQUIT command is sent or the POP3 server closes the communication (Inactivity time out)

13.9.2. +KPOPLIST: List Available Mail

AT+KPOPLIST : List Available Mail in POP3	**HiLoV2 HiAll only**
Read command Syntax **AT+KPOPLIST?**	 Response **+KPOPLIST: <N> messages (<size> octets)** **OK**
Action command Syntax **AT+KPOPLIST**	 Response **+KPOPLIST: <N> messages (<size> octets)** **+KPOPLIST: <n1>,<size1>[<CR><LF>** **+KPOPLIST: <n2>,<size2>[…]]** **OK** Parameters **<N>:** Numeric type. Indicates the number of available messages **<size>:** Numeric type. Indicates the total size of the messages **<n#>:** Numeric type. Indicates the index of the message **<size#>:** Numeric type. Indicates the size in octet of the message #
Reference Sierra Wireless Proprietary	Notes • This command lists available mail in the POP3 server

13.9.3. +KPOPREAD: Download a Mail

AT+KPOPREAD : Download a mail from POP3	**HiLoV2 HiAll only**
Test command Syntax **AT+KPOPREAD=?**	 Response **+KPOPREAD: <index>** **OK**
Write command Syntax **AT+KPOPREAD=<index>**	 Response **CONNECT** Dataflow with **<EOF pattern>** at the end **OK** **+CME ERROR: <err>** **NO CARRIER** Parameters **<index>:** Numeric type. Indicates the index of the mail to read **<EOF pattern>:** Set AT+KPATTERN

AT+KPOPREAD : Download a mail from POP3	HiLoV2 HiAll only
Reference Sierra Wireless Proprietary	Notes • Whether the asked mail ID is wrong the command returns the associated error code nonetheless the connection with the server is maintained • Whether an error is detected during the mail transfer, the connection with the server is closed • Hardware flow control(AT&K3) is required for serial link • The behavior of DTR drop meet with AT&D • Using "+++" can abort sending data and using ATO[n] to return back

13.9.4. +KPOPDEL: Delete a Mail

AT+KPOPDEL: Delete a mail from POP3	HiLoV2 HiAll only
Test command Syntax **AT+KPOPDEL=?**	 Response **+KPOPDEL: <index>** **OK**
Write command Syntax **AT+KPOPDEL=<index>**	 Response **OK** Parameters **<index>:** Numeric type. Indicates the index of the mail to delete
Reference Sierra Wireless Proprietary	Notes • Whether the asked mail ID is wrong the command returns the associated error code nonetheless the connection with the server is maintained • The mail actually deleted by the server after the KPOPQUIT command

13.9.5. +KPOPQUIT: Close Connection

AT+KPOPQUIT: Close POP3 connection	HiLoV2 HiAll only
Action command Syntax **AT+KPOPQUIT**	 Response **OK**
Reference Sierra Wireless Proprietary	Notes • This command closes the connection

13.9.6. Specific Error Codes for POP3 Commands

As an error can occur while there is no command in progress, an unsolicited notification is sent:

+KPOPNOTIF: <err>

For solicited and unsolicited notifications, error codes will have the following meanings:

Code of <err>	Meaning
3100	Invalid POP server name
3101	Not connected to the server
3104	POP session ID is not available
3110	The login or the password got an invalid value or the server is busy
3111	Invalid mail index
3140	The POP transfer failed due to connection (GSM or GPRS) fails
3141	The POP transfer failed due to TCP connection troubles
3142	The TCP connection timeout
3143	The POP download failed due to Request time out
3145	The POP transfer failed due to DTR drop
3149	The POP transfer download failed due to internal error
3150	The POP transfer failed due to POP server trouble
3151	DNS Server address error or failed to resolve the host address

13.10. HTTP Client Specific Commands

13.10.1. +KHTTPCFG: HTTP Connection Configuration

<table>
<tr><th colspan="2">AT+KHTTPCFG : HTTP connection configuration HiLoV2 HiAll only</th></tr>
<tr><td>Read command

Syntax
AT+KHTTPCFG?</td><td>

Response
+KHTTPCFG: <cnx cnf>,<http_server>,<http_port>[<CR><LF></td></tr>
<tr><td>Write command

Syntax
AT+KHTTPCFG=[<cnx cnf>,]<http_server>[,<http_port>[,<http_version>[,<login>[,<password>]]]]</td><td>

Response
+KHTTPCFG: <session_id>
OK

Error case
+CME ERROR: <err>

Parameters
<cnx cnf>: [0..7] (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see KCNXCFG)
<session_id>: Index of the HTTP session.
<http_server >: Dot-separated numeric (0-255) parameters on the form a1.a2.a3.a4 or explicit name of the remote server.
<http_port>: Numeric parameter (0-65535), 80 by default
<http_version>: 0: HTTP 1.1(by default)
1: HTTP 1.0
<login>: string type, indicates the user name to be used during the HTTP connection
<password>: string type, indicates the password to be used during the HTTP connection</td></tr>
<tr><td>Reference
Sierra Wireless Proprietary</td><td>Notes
• <http_port> and <http_server> define the port and the IP address of the remote server one wants to connect
• <session_id> is always 0</td></tr>
</table>

13.10.2. +KHTTPHEADER: Set the HTTP Request Header

AT+KHTTPHEADER : Set the HTTP request header	**HiLoV2 HiAll only**
Read command Syntax **AT+KHTTPHEADER?**	Response **+KHTTPHEADER:** **<CR><LF>** **[…]**
Write command Syntax **AT+KHTTPHEADER=<session_id>[,<local_uri>]**	Response **OK** Error case **+CME ERROR: <err>** Parameters **<session_id>:** Index of the HTTP session **<local_uri>:** “<file name>”. If local_uri is empty, data will be input from serial link
Reference Sierra Wireless Proprietary	Notes • **<session_id>** is always 0 • File (local_uri) should be put into the directory "/ftp" • User must use **<EOF pattern>** to finish sending, then module returns to command mode

13.10.3. +KHTTPGET: Get HTTP Server Information

AT+KHTTPGET : Get information from HTTP server	**HiLoV2 HiAll only**
Write command Syntax **AT+KHTTPGET=** **<session_id>,** **<request_uri>**	Response **CONNECT** **…<EOF pattern>** **OK** Error case **NO CARRIER** **+CME ERROR: <err>** **+KHTTP_ERROR: <session_id>, <http_notif>**

AT+KHTTPGET : Get information from HTTP server	**HiLoV2 HiAll only**
Write command Syntax **AT+KHTTPGET=** **<session_id>,** **<request_uri>**	Parameters **<session_id>:** Index of the HTTP session **<request_uri>:** string type, indicates the information url to get during the HTTP connection **<http_notif>:** Integer type. Indicates the cause of the HTTP connection failure 4- DNS error 5- HTTP connection error due to internal trouble 6- HTTP connection timeout 7- Flash access trouble 8- Flash memory full 9- triple plus (+++) error (switch to command mode) 10-HTTP got no data 11-HTTP got partial data
Reference Sierra Wireless Proprietary	Notes • **<session_id>** is always 0 • HTTP does not support DTR1

13.10.4. +KHTTPHEAD: Get the Head of the Information from HTTP Server

AT+KHTTPHEAD : Get the head of the information from HTTP server	**HiLoV2 HiAll only**
Write command Syntax **AT+KHTTPHEAD=** **<session_id>,** **<request_uri>**	Response **CONNECT** **…<EOF pattern>** **OK** Error case **NO CARRIER** **+CME ERROR: <err>** **+KHTTP_ERROR: <session_id>, <http_notif>** Parameters **<session_id>:** Index of the HTTP session **<request_uri>:** string type, indicates the information url to be get during the HTTP connection
Reference Sierra Wireless Proprietary	Notes • **<session_id>** is always 0 • HTTP does not support DTR1 • This method is identical to GET except that the server MUST NOT return a message-body in the response. The meta-information contained in the HTTP headers in response to a HEAD request SHOULD be identical to the information sent in response to a GET request

13.10.5. +KHTTPPOST: Send Data to HTTP Server

AT+KHTTPPOST : Send data to HTTP server	**HiLoV2 HiAll only**
Write command Syntax **AT+KHTTPPOST=** **<session_id>,<local_uri>,** **<request_uri>**	Response **CONNECT** **…<EOF pattern>** **OK** Error case **NO CARRIER** **+CME ERROR: <err>** **+KHTTP_ERROR: <session_id>, <http_notif>** Parameters **<session_id>:** Index of the HTTP session **<local_uri>:** "<file name>". If local_uri is empty, data will be input from serial link **<request_uri>:** string type, indicates the program handling the data during the HTTP connection
Reference Sierra Wireless Proprietary	Notes • **<session_id>** is always 0 • HTTP doesn't support DTR1 • File (local_uri) should be put into the directory "/ftp" • Before using this command, it is highly recommended to configure the module for Hardware flow control, using the command **AT&K3**

13.10.6. +KHTTPCLOSE: Close an HTTP Connection

AT+KHTTPPOST : Close an HTTP connection	**HiLoV2 HiAll only**
Write command Syntax **AT+KHTTPCLOSE=** **<session_id>**	Response **OK** Error case **+CME ERROR: <err>** Parameters **<session_id>:** Index of the HTTP session
Reference Sierra Wireless Proprietary	Notes • **<session_id>** is always 0

13.11. HTTPS Client Specific Commands

13.11.1. +KHTTPSCFG: HTTPS Connection Configuration

AT+KHTTPSCFG: HTTPS Connection Configuration	**HiloV2 HiAll only**
Read command Syntax **AT+KHTTPSCFG?**	Response **+KHTTPSCFG: <cnx cnf>,<http_server>,<https_port>,<http_version>,<cipher suite>,<sec_level>,<login>,<password><CR><LF>** **OK**

Write command

Syntax

AT+KHTTPSCFG=[<cnx cnf>,]<http_server>[,<https_port>[,<http_version>[,<cipher_suite>[,<sec_level>[,<login>[,<password>]]]]]]

Response

+KHTTPSCFG: <session_id>

OK

Error case

+CME ERROR: <err>

Parameters

<cnx cnf> [0..7] (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see KCNXCFG).

<session_id> :Index of the HTTP session.

<http_server> :Dot-separated numeric (0-255) parameters on the form a1.a2.a3.a4 or explicit name of the remote server.

<https_port> :Numeric parameter (0-65535), 443 by default.

<http_version> 0: HTTP 1.1(by default)
1: HTTP 1.0

<cipher_suite>:

0- TLS_RSA_CHOOSE_BY_SERVER [default]

1- TLS_RSA_WITH_RC4_128_MD5

2- TLS_RSA_WITH_RC4_128_SHA

3- TLS_RSA_WITH_DES_CBC_SHA

4- TLS_RSA_WITH_3DES_EDE_CBC_SHA

5- TLS_RSA_EXPORT1024_WITH_DES_CBC_SHA

6- TLS_RSA_WITH_AES_128_CBC_SHA

7- TLS_RSA_WITH_AES_256_CBC_SHA

<sec_level>:

1- No authentication [default]

2- Manage server authentication

3- Manage server and client authentication if requested by remote server

<login>: string type, indicates the user name to be used during the HTTPS connection.

<password>: string type, indicates the password to be used during the HTTPS connection.

Reference

Sierra Wireless Proprietary

Notes

- <**https_port**> and <**http_server**> define the port and the IP address of the remote server one wants to connect.
- **<session_id>** is always 0.
- For **<sec_level>:**2, 3, it must load certificates or private key from file system. See **SSL Certificate Manager** for it.
- Any certificates referenced in HTTPS feature should be DER encoded
- Any private key referenced in HTTPS feature should be DER- PKCS#8 encoded.

13.11.2. +KHTTPSHEADER: Set the header of the request

AT+KHTTPSHEADER: Set the header of the request	**HiloV2 HiAll only**
Read command Syntax **AT+KHTTPSHEADER?**	Response **+KHTTPSHEADER: <CR><LF>** **[…]**
Write command Syntax **AT+KHTTPSHEADER=<session_id>[,<local_uri>]**	Response **OK** Error case **+CME ERROR: <err>** Parameters **<session_id>:** Index of the HTTPS session. **<local_uri>:** "<file name>". If local_uri is empty, data will be input from serial link.
Reference Sierra Wireless Proprietary	Notes • **<session_id>** is always 0. • File (local_uri) should be put into the directory "/ftp". • User must use **<EOF pattern>** to finish sending, then module returns to command mode.

13.11.3. +KHTTPSGET: Get information from HTTP server

<table>
<tr><th colspan="2">AT+KHTTPSGET: Get information from HTTP server HiloV2 HiAll only</th></tr>
<tr><td>Write command

Syntax
AT+KHTTPSGET=
<session_id>,<request_uri></td><td>

Response
CONNECT
…<EOF pattern>
OK

Error case
NO CARRIER
+CME ERROR: <err>
+KHTTPS_ERROR: <session_id>, <http_notif>

Parameters
<session_id>: Index of the HTTP session.
<request_uri>: string type, indicates the information url to be get during the HTTPS connection.
<http_notif>: Integer type. Indicates the cause of the HTTPS connection failure.
4- DNS error
5- HTTP connection error due to internal trouble
6- HTTP connection timeout
7- Flash access trouble
8- Flash memory full
9- triple plus (+++) error (switch to command mode)
10-HTTP got no data
11-HTTP got partial data
12-Validate server’s certificate error
13-Initialize SSL error</td></tr>
<tr><td>Reference
Sierra Wireless Proprietary</td><td>Notes
• <session_id> is always 0.
• HTTPS does not support DTR1.</td></tr>
</table>

13.11.4. +KHTTPSHEAD: Get the head of the information from HTTP server

AT+KHTTPSHEAD: Get the head of the information from HTTP server	**HiloV2 HiAll only**
Write command Syntax **AT+KHTTPSHEAD=** **<session_id>,<request_uri>**	Response **CONNECT** **…<EOF pattern>** **OK** Error case **NO CARRIER** **+CME ERROR: <err>** **+KHTTPS_ERROR: <session_id>, <http_notif>** Parameters **<session_id>:** Index of the HTTPS session. **<request_uri>:** string type, indicates the information url to be get during the HTTPS connection.
Reference Sierra Wireless Proprietary	Notes • **<session_id>** is always 0. • HTTPS does not support DTR1. • This method is identical to GET except that the server MUST NOT return a message-body in the response. The meta-information contained in the HTTP headers in response to a HEAD request SHOULD be identical to the information sent in response to a GET request.

13.11.5. +KHTTPSPOST: Send data to HTTP server

AT+KHTTPSPOST: Send data to HTTP server	**HiloV2 HiAll only**
Write command Syntax **AT+KHTTPSPOST=** **<session_id>,<local_uri>,<request_uri>**	Response **CONNECT** **…<EOF pattern>** **OK** Error case **NO CARRIER** **+CME ERROR: <err>** **+KHTTPS_ERROR: <session_id>, <http_notif>** Parameters **<session_id>:** Index of the HTTPS session. **<local_uri>:** "<file name>". If local_uri is empty, data will be input from serial link. **<request_uri>:** string type, indicates the programme handling the data during the HTTPS connection.
Reference Sierra Wireless Proprietary	Notes • **<session_id>** is always 0. • HTTPS doesn't support DTR1. • File (local_uri) should be put into the directory "/ftp". • Before using this command, it is highly recommended to configure the module for Hardware flow control, using the command **AT&K3**

13.11.6. +KHTTPSCLOSE: Close a HTTPS connection

AT+KHTTPPOST: Close a HTTP connection	HiloV2 HiAll only
Write command Syntax **AT+KHTTPSCLOSE=** **<session_id>**	Response **OK** Error case **+CME ERROR: <err>** Parameters **<session_id>:** Index of the HTTPS session.
Reference Sierra Wireless Proprietary	Notes • **<session_id>** is always 0.

13.12. SSL Certificate Manager

13.12.1. +KCERTSTORE: Store root CA and local certificates to file system

AT+KCERTSTORE: Store root CA and local certificates to file system	HiloV2 HiAll only
Read command Syntax **AT+KCERTSTORE?**	Response **+KCERTSTORE** **[root_cert,<NbData><CR><LF>** **<File_data><CR><LF>]** **[local_cert,<index>,<NbData><CR><LF>** **<File_data> <CR><LF>]** **[...]** **OK** Error case **+CME ERROR: <err>**

Write command Syntax **AT+KCERTSTORE=<data_type>,<NbData>[,<index>]**	 Response **CONNECT** **OK** Error case **+CME ERROR: <err>** Parameters **<data_type>:** 0- Root certificate 1- Local certificate **<NbData> :** Number of bytes to read/write (mandatory for both reading and writing). Value range: 1-3000. **<index> :** Index of the stored local certificate. Value range: 0-2. If a local certificate is already stored at the index, it will be overloaded. 0 by default. **<File_data>:** File data in bytes.
Reference Sierra Wireless Proprietary	Notes • The <index> parameter is the link between a local certificate and a private key (cf. +**KPRIVKSTORE** and +**KCERTDELETE**).

13.12.2. +KPRIVKSTORE: Store private key associated to a local certificate

AT+KPRIVKSTORE: Store private key associated to a local certificate	**HiloV2 HiAll only**
Read command Syntax **AT+KPRIVKSTORE?**	 Response **+KPRIVKSTORE** **private_key,<index>,<NbData><CR><LF>** **<File_data> <CR><LF>** **OK** Error case **+CME ERROR: <err>**

Write command Syntax **AT+KPRIVKSTORE= <index>,<NbData>**	 Response **CONNECT** **OK** Error case **+CME ERROR: <err>** Parameters **<index>** **:** Index of the stored local certificate associated to this private key. **<NbData>** **:**Number of bytes to read/write (mandatory for both reading and writing). Value range: 1-3000. **<File_data>:** File data in bytes.
Reference Sierra Wireless Proprietary	

13.12.3. +KCERTDELETE: Delete local certificate from the index

AT+KCERTDELETE: Delete local certificate from the index	**HiloV2 HiAll only**
Read command Syntax **AT+KCERTDELETE?**	 Response **+KCERTDELETE:** **OK** Error case **+CME ERROR: <err>**

Write command Syntax **AT+KCERTDELETE=<data_type>[,<index>]**	Response **OK** Error case **+CME ERROR: <err>** Parameters **<data_type>:** 0- Root certificate 1- Local certificate **<index>:** Index of the stored local certificate. Value range: 0-2. 0 by default.
Reference Sierra Wireless Proprietary	Notes

14. Specific Flash Commands

14.1. +KFSFILE: Flash File Operation Command

AT+KFSFILE : File operation command	
Test command Syntax **AT+KFSFILE =?**	 Response **+KFSFILE: (0,1,2,3,4,5),(URI),(SIZE)** **OK**
Write command Syntax **AT+KFSFILE=<action>,<url>[,<NbData>]**	 Response **CONNECT** **OK** **+KFSFILE: <entity type> <name> <size>** **+KFSFILE: <size> bytes free** Parameters **<action>:** 0 Write file 1 Read file 2 Delete file 3 Return file size 4 List directory and file information 5 Write at the end of file (Append mode) **<uri>:** "/<directory name>/<file name>" (warning: the "/" is important) **<NbData>:** Number of bytes to read/write (mandatory for both reading and writing) **<entity type>:** F File D Directory **<name>:** File name or directory name **<size>:** File size or free size of the directory
Reference Sierra Wireless Proprietary	Notes • The minimum reserved memory is 100 Kbytes • The user can abort read/write operation by DTR or +++ • When in Append mode: - If the target file of <url> does not exist, it will create a new file and write - If the target file of <url> exists, it will append data to the end of file • Currently user can only use **<data>**, **<ftp>**, **<gps>** and **<app>** directories • CME error 20 will be reported, if memory is full when writing • CME error 23 will be reported, when module start up, because of boot up of file system

AT+KFSFILE : File operation command	
Example	• To add a file: **AT+KFSFILE=0,"/data/dummyfile.bin",1024** **CONNECT** The module is ready to receive the file. Once received, the answer is: **OK** • To read the newly added file: **AT+KFSFILE=1,"/data/dummyfile.bin",1024** **CONNECT** <lists file content…> **OK** • To delete the file: **AT+KFSFILE=2,"/data/dummyfile.bin"** **OK** • To list the size of the file: **AT+KFSFILE=3,"/data/dummyfile.bin"** **+KFSFILE: 1024** **OK** • To list the information of directory and file: **AT+KFSFILE=4,"/data/"** **+KFSFILE: <F> dummyfile.bin 1024** **+KFSFILE: 1048004 bytes free** **OK** • To list the information of root directory: **AT+KFSFILE=4,"/"** **+KFSFILE: <D> ftp 0** **+KFSFILE: <D> data 1024** **+KFSFILE: 1048004 bytes free** **OK** • To add bytes to an existing file Append mode): **AT+KFSFILE=5,"/data/dummyfile.bin",128** **CONNECT** The module is ready to receive the new 128 bytes. Once received, the answer is: **OK** Now the size is 1152 (1024+128): **AT+KFSFILE=3,"/data/dummyfile.bin"** **+KFSFILE: 1152** **OK**

15. MMS commands

15.1. Command set overview

The MMS commands are a set of dedicated commands to exchange objects between a TE and a ME.

AT+KMMCNF	MMS Configuration
AT+KPSL	List of objects
AT+KPSR	Reading an object
AT+KPSW	Writing an object
AT+KPSD	Deleting an object
AT+KPSSEND	Send MMS
AT+KPSCAP	Retrieving Capabilities of the mobile
AT+KMMRET	Retrieve MMS from MMS server

+KMMA	Notification : New MMS available on MMS Center
+KMMREC	Notification : retrieve of MMS from MMSC (to ME)

15.2. Automatic retrieval

By default, each time a new MMS is present on the MMSC, a notification is sent to the modem, that sent the +KMMA notification to the TE.

Then, the modem automatically retrieves the new MMS: the MMS is got from the MMSC to the ME. When the retrieval is done, the ME sends a +KMMREC notification to the TE.

15.3. Examples

The procedure to configure the modem for MMS use is:

- AT+KMMCNF to configure the modem
- AT+KPSCAP to get the MMS capabilities of the modem

The procedure to send a MMS is:

- AT+KPSW=? to check the space available for a new MMS
- AT+KPSW to write a MMS onto the mobile
- AT+KPSSEND to send this MMS on the network
- AT+KPSD to delete this MMS

Typical reception of MMS:

- +KMMA : notification of new MMS on the MMSC
- +KMMREC : notification of MMS retrieval
- AT+KPSR to read this MMS
- AT+KPSD to delete this objects

The procedure to manage MMS in the modem is:

- AT+KPSL to get the list of object in all locations
- AT+KPSD to delete objects

When automatic retrieval does not work or is not required, the procedure to get a MMS from the MMS Center is:

- AT+KMMRET to get the MMS
- AT+KPSR to read one MMS
- AT+KPSD to delete this MMS

15.4. MMS PDU

MMS are manipulated under a PDU (Protocol Data Unit) format. This format defined in the GSM standard is used to exchange the MMS on the network.

15.5. Parameter <index>

The parameter <index> is defined as a string type; 10-bytes type values, Unique ID from which ME identifies the MMS.

For instance, the 10 following bytes, given in hexadecimal notation 11 22 33 44 55 66 77 88 99 AA represent the index 1122334455667788 99AA in hexadecimal notation.

Just notice that these 10 bytes may contain bytes that cannot be displayed (code hexadecimal from 00 to 1F), and in these codes stands the NULL character (code 0x00).

15.6. +KMMCNF Command: MMS Configuration

AT+KMMCNF : MMS configuration	**HiLoV2 HiAll only**
Test command Syntax **AT+KMMCNF=?**	 Response **+KMMCNF:** (list of supported **<mode>**s),(list of supported **<unsolicited messages states>**s),(list of supported **<port type>**s),(list of supported **<numbering mode>**s)
Read command Syntax **AT+KMMCNF?**	 Response **+KMMCNF: 0,<unsolicited messages state>** **+KMMCNF: 1,< url server>** **+KMMCNF: 3,<apn>,<login>,<password>,<IP address>,<port type>** **+KMMCNF: 4, <connection type>**

AT+KMMCNF : MMS configuration	**HiLoV2 HiAll only**
Write command Syntax **AT+KMMCNF =** **0,< unsolicited messages state >** **AT+KMMCNF =1,< url server >** **AT+KMMCNF =3,< apn>, <login>, <password>,<IP address>,<port type>** **AT+KMMCNF =4,< connection type >**	Response **OK** Parameters **< unsolicited messages state >:** 0 unsolicited messages deactivate 1 unsolicited messages activate **< url server >:** string type ; the url server of MMSC **< login>:** string type ; the user name of the GPRS connection **<password>:** string type ; password of the GPRS connection **<IP address>:** Consists of dot-separated numeric (0-255) parameters on the form a1.a2.a3.a4, indicates the IP address of the operator's proxy. **<port type>:** type of port of the GPRS connection : 0 unsecured 1 secured **<apn>:** (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network **< connection type >:** 1 GPRS
Reference Sierra Wireless Proprietary	Notes • Only GPRS bearer is supported

15.7. +KPSL Command: List of Objects

AT+KPSL : List of objects	**HiLoV2 HiAll only**
Test command Syntax **AT+KPSL =?**	Response **+KPSL:** (list of supported **<category>**s or not)
Read command Syntax **AT+KPSL?**	Response **OK**
Write command Syntax **AT+KPSL=** **<category>,[<mode>]**	Response If <mode> = 0 or omitted: **[+KPSL: <index1>,<hidden>]** **…** **[+KPSL: <indexn>,<hidden>]** If <mode> = 1: **[+KPSL:<index1>,<hidden>,<obj_size>,<category>,<content>,<location>,[<flag>],<desc_str>,<sname>]** **…** **[+KPSL:<indexn>,<hidden>,<obj_size>,<category>,<content>,<location>,[<flag>],<desc_str>,<sname>]**

AT+KPSL : List of objects	**HiLoV2 HiAll only**
Write command Syntax **AT+KPSL=** **<category>,[<mode>]**	Parameters **<category>:** use "MMS" only; other values are reserved **<mode>:** 0 only basic information are returned 1 extended information **<index>:** string type; 10-bytes type values, Unique ID from which ME identifies the MMS **<hidden>:** numeric parameter; indicates if the entry is hidden or not 0: entry not hidden or hidden property not supported by <category> 1: entry hidden (MMS is copyrighted) **<obj_size>:** numeric parameter; size of the object in bytes **<content>:** only one value possible with MMS : “MMS” : Multimedia message **<location>:** string type; location of message. Currently defined location are: ”INBOX” : the MMS that are read or unread or unretrieved ”DRAFT” : the MMS that are drafts ”OUTBOX” : the MMS that are unsent ”SENTBOX” : the MMS that have been sent **<flag>:** string type ; status of message in INBOX. Currently defined status are: "READ" : the MMS is read (and stored in INBOX ME) "UNREAD" : the MMS is unread (and stored in INBOX ME) "UNRETRIEVED" : the MMS is unretrieved (and stored in INBOX ME) **<desc_str>:** string type of max 30 characters. This string may be used to give specific information about the object to the user. May be an empty string if no specific info available. Character set as specified by command Select TE Character Set +CSCS **<sname>:** string type; short name. This string is the first 30 characters of the name of the object, if the object has one. Empty string if no name is available for this object. Character set as specified by command Select TE Character Set +CSCS
Reference	Notes • A MMS "hidden" is a temporary MMS, hidden to the user • Copyrighted MMS are not set as hidden. See AT+KPSR for this kind of MMS • "UNRETRIEVED" means that the MMS is available on the MMSC. This is a temporary MMS in the ME that refers to the MMS in the MMSC • With automatic retrieval, "UNRETRIEVED" state should be temporary. That means that the modem is trying to retrieve the MMS at now. A special case may occur when the ME cannot retrieve itself the MMS. The TE is then advised with the notification +KMMREC • When automatic retrieval is failed or is not required, a MMS "UNRETRIEVED" must be retrieved with AT+KMMRET command before reading : MMS "UNRETRIEVED" cannot be accessed by read operation • When using AT+KMMRET, a MMS in the list given by +KPSL, and with the state "UNRETRIEVED", is retrieved ant its state goes to "UNREAD" • When using AT+KPSR, a MMS in the list given by +KPSL, and with the state "UNREAD", goes to the state "READ"

15.8. +KPSR Command: Read an Object

AT+KPSR : Read an object	**HiLoV2 HiAll only**
Test command	

AT+KPSR : Read an object	**HiLoV2 HiAll only**
Syntax **AT+KPSR =?**	Response **OK**
Read command Syntax **AT+KPSR?**	 Response **OK**
Write command Syntax **AT+KPSR =<index>**	 Response **+KPSR: <size>** **CONNECT** **<data>** **NO CARRIER** Parameters **<index>:** string type; (10-bytes), Unique ID from which ME identifies the MMS **<size>:** numeric type; number of bytes of MMS pdu **<data>:** MMS pdu
Reference Sierra Wireless Proprietary	Notes • Execution command read specified entry, identified by its <index>. TE informs ME that it wants to establish a data connection to retrieve an object. If ME has succeeded in establishing a logical link between application protocols and external interface, it will send CONNECT message to the TE, preceded by +KPSR: <size> so TE is able to know how big the received object will be • Otherwise, the NO CARRIER response will be returned. If the CONNECT response is sent, the ME will follow with sending object. After sending the object, the ME will return in command mode • In case of a DTR drop from active to inactive during the transfer (when in "Data" mode), transmission will be aborted. In this case, the ME will return to command mode. ATO[n] is not supported to back to data mode • When the index corresponds with a protected (copyrighted) MMS, then MMS headers ONLY can be read by the TE. Moreover after first reading of MMS, MMS status changes from "UNREAD" to "READ" • Notice that this command executed on a MMS "UNRETRIEVED" produce an error

15.9. +KPSW Command: Write an object

AT+KPSW : Write an object	**HiLoV2 HiAll only**
Test command Syntax **AT+KPSW =?**	 Response **+KPSW:** (list of supported **<content>**s), **<maximum size>**
Read command Syntax **AT+KPSW?**	 Response **OK**
Write command Syntax **AT+KPSW=<content>,**	 Response **CONNECT**

AT+KPSW : Write an object	**HiLoV2 HiAll only**
<size>	**<data>** **NO CARRIER** Parameters **<content>:** use "MMS" only; other values are reserved **<size>:** numeric type; number of bytes of the MMS pdu **<maximum size>:** long type values, the size of the biggest receivable object in bytes **<data>:** MMS pdu
Reference Sierra Wireless Proprietary	Notes • TE informs ME that it wants to establish a data connection to send an object. If ME has succeeded in establishing a logical link between application protocols and external interface, it will send CONNECT message to the TE, Otherwise, the NO CARRIER response is returned. If the CONNECT response is sent, the TE will follow by sending the object. After receiving the object, the ME will return to command mode and return: - the <index> of the object if the object was in a correct format - +CME ERROR: 100, <err_code> if the object was not in a correct format • In case of a DTR drop from active to inactive during the transfer (when in "Data" mode), transmission will be aborted. In this case, ME will return to command mode. ATO[n] is not supported to back to data mode

15.10. +KPSD Command: Delete an Object

AT+KPSD : Delete an object	**HiLoV2 HiAll only**
Test command Syntax **AT+KPSD =?**	 Response **OK**
Read command Syntax **AT+KPSD?**	 Response **OK**

AT+KPSD : Delete an object	**HiLoV2 HiAll only**
Write command Syntax **AT+KPSD =<index>** **AT+KPSD= ,<category>,<location> [,<flag>]**	Response **OK** Parameters **<index>:** string type; 10-bytes type values, Unique ID from which ME identifies the MMS. **<category>:** use "MMS" only; other values are reserved **<location>:** string type; location of messages to delete. "ALL" : delete all MMS in ME "INBOX" : delete all MMS that are read or unread or unretrieved in ME "DRAFT" : delete all MMS that are drafts in ME "OUTBOX" : delete all MMS that are unsent in ME "SENTBOX" : delete all MMS that have been sent in ME **<flag>:** string type ; status of message in INBOX "ALL" : delete all MMS (stored in INBOX ME) "READ" : delete all MMS read (and stored in INBOX ME) "UNREAD" : delete all MMS unread (and stored in INBOX ME) "UNRETRIEVED" : delete all MMS unretrieved (and stored in INBOX ME)
Reference Sierra Wireless Proprietary	Notes • When "INBOX" is specified in <location>, <flag> must be specified • When a MMS is being retrieved, its deletion is not possible • Example : AT+KPSD =,"MMS","ALL"

15.11. +KPSSEND Command: Send MMS

AT+KPSSEND : Send MMS	**HiLoV2 HiAll only**
Test command Syntax **AT+KPSSEND =?**	Response **OK**
Read command Syntax **AT+KPSSEND?**	Response **OK**
Write command Syntax **AT+KPSSEND=, <category>,<flag>**	Response **+KPSSEND: <nbEligibleMMS>** **OK** is returned immediately Then, the result of the sending of each MMS is sent to TE in unsolicited messages (one message for each MMS): **+KPSSR: <index>,<result>,<TrID>[,<MsgID>]**

AT+KPSSEND : Send MMS	**HiLoV2 HiAll only**
Write command Syntax **AT+KPSSEND=, <category>,<flag>**	Parameters **<index>:** string type; 10-bytes type values, Unique ID from which ME identifies the MMS **<category>:** use "MMS" only; other values are reserved **<flag>:** number used for sending MMS based upon status. Use "ALL" only (send all MMS stored in ME) **<nbEligibleMMS>:** number of MMS that are eligible to be sent (correctly formatted, at least one “To” field present in headers, …). Thus, this indicates how many unsolicited messages will be returned to TE **<result>:** result of the sending of the MMS corresponding to <index>. It may be 0 if the result of the sending was OK, or an error code if NOK. In any case, ME will continue to send the remaining MMS **<TrID>:** (transaction ID) string type; 20-bytes type value, indicates of unique means a transaction between the ME and the server **<MsgID:** (message ID) string type; 20-bytes type value is possibly given by the server to identify a message of unique means
Reference Sierra Wireless Proprietary	Notes • If the result code is NOK, the network may be in cause; it may be also an non-existent destination address • Example : AT+KPSSEND="53079300000008FF03E9"

15.12. +KPSCAP Command: Retrieve Mobile Capabilities

AT+KPSCAP : Retrieve mobile capabilities	**HiLoV2 HiAll only**
Test command Syntax **AT+KPSCAP=?**	Response **+KPSCAP:** (list of supported **<category>**s)
Read command Syntax **AT+KPSCAP?**	Response **OK**
Write command Syntax **AT+KPSCAP=<category>**	Response **+KPSCAP:** **CONNECT[...]** **NO CARRIER** Parameters **<MMSE Version>:** Version of the MMSE protocol used by the module **<WSP version>:** Version of the WSP protocol used by the module **<WTP Version>:** Version of the WTP protocol used by the module
Reference Sierra Wireless Proprietary	

15.13. +KMMRET Command: Retrieve MMS

AT+KMMRET : Retrieve MMS	**HiLoV2 HiAll only**
Test command Syntax **AT+KMMRET=?**	 Response **OK**
Read command Syntax **AT+KMMRET?**	 Response **OK**
Write command Syntax **AT+KMMRET=<index>** **AT+KMMRET=,<flag>**	Response **+KMMRET: <nbEligibleMMS>** **OK** is returned immediately Then, the result of the retrieving of each MMS is sent to TE in unsolicited messages (one message for each MMS): **+KMMREC: <index>,<result>** Parameters **<index>:** string type; 10-bytes type values, Unique ID from which ME identifies the MMS **<flag>:** string type; indicates the status of message to retrieve; only one value allowed : "ALL" **<nbEligibleMMS>:** number of MMS eligible to be retrieved. Thus, this indicates how many unsolicited messages will be returned to TE **<result>:** result of the retrieving of the MMS corresponding to <index>. In any case of error, ME will continue to retrieve the remaining MMS 0 The MMS is retrieved without error 1 Network problem 2 MMS retrieval refused by MMSC 3 Wap stack busy 4 Not enough space to receive MMS
Reference Sierra Wireless Proprietary	Notes • This command retrieves the MMS from the MMSC, and to store it in the modem. Refer to AT+KPSR to read this MMS • This command is useful only in the case of automatic retrieval failed or not required

15.14. +KMMA Notification: MMS in MMSC Notification

+KMMA Notification : MMS in MMSC notification	**HiLoV2 HiAll only**
Unsolicited notification	Unsolicited Message **+KMMA: <index>** Parameters **<index>:** string type; 10-bytes type values, Unique ID from which ME identifies the MMS

+KMMA Notification : MMS in MMSC notification	HiLoV2 HiAll only
Reference Sierra Wireless proprietary	Notes • When a MMS is available in MMSC then an indication is routed to the TE using unsolicited result code This MMS is not directly available by read operation. AT+KMMRET must be used to retrieved it from MMSC : this notification is useful only in the case of automatic retrieval not required

15.15. +KMMREC Notification: MMS in ME Notification

+KMMREC Notification : MMS in ME notification	HiLoV2 HiAll only
Unsolicited notification	Unsolicited Message **+KMMREC: <index>,<result>** Parameters **<index>:** string type; 10-bytes type values, Unique ID from which ME identifies the MMS **<result>:** result of the retrieving of the MMS corresponding to <index>. In any case of error, ME will continue to retrieve the remaining MMS 0 The MMS is retrieved without error. 1 Network problem 2 MMS retrieval refused by MMSC 3 Wap stack busy
Reference	Notes • When a MMS is available in ME, after it has been retrieved, then an indication is routed to the TE using unsolicited result code • This unsolicited message is sent, for example, after the use of AT+KMMRET. If the retrieval fails, after several retries, the ME send to the TE a +KMMREC notification with the adequate error code. In this case, the TE must correct the error cause, and the perform the AT+KMMRET command itself

16. ECALL commands

ECALL is an optional feature, for further information please contact your FAE.

These commands are not supported on HiLo V1.

See reference document: **[26.267]** (3GPP 26.267 eCall Data Transfer - In-band modem solution).

16.1. System overview

16.1.1. eCall

In the event of a vehicle collision, the eCall is an automatically or manually established emergency voice call from the vehicle via the cellular network to the local emergency agencies). Thanks to in-band modem solution, a data message is transferred from the IVS to the PSAP. This message is contains the information stored in the Minimum Set of Data (MSD).

eCall can be included in the “In Vehicle System (IVS). Emergency agencies can use the Public Safety Answering Point (PSAP) networks.

16.1.2. Minimum Set of Data (MSD)

For more details about the MSD format, see 18.18.

Unsupported fields

Optional fields that are not supported are:

- Additional data.

Supported fields

All mandatory fields and the following optional fields:

- Recent vehicle location n-1
- Recent vehicle location n-2
- Number of passengers

Stored internal information

The following information is stored in NVM so can be written only once:

- Vehicle type
- VIN
- Propulsion type

RQT_END

16.2. Audio Settings during ECALL

During an Ecall the audio settings change automatically to improve the data transmission.

Ecall state	Current Audio settings	VIP
Before Ecall	Audio settings 0 *(customer default configuration)*	V*
Calling PSAP	Audio settings 1 *(Disable Echo Cancellation and Noise Suppression, Mute audio input and output)*	4
MSD transmission	Audio settings 1 *(Disable Echo Cancellation and Noise Suppression, Mute audio input and output)*	4
Switch to audio call	Audio settings 2 *(active Echo Cancellation, Noise Suppression, audio input and output)*	3
PSAP request of MSD transmission	Audio settings 1 *(Disable Echo Cancellation and Noise Suppression, Mute audio input and output)*	4
End of Ecall	Audio settings 0 *(customer default configuration)*	V*

* V means the current VIP set by the user among 0, 1 or 2

During an Ecall, no other audio session can be opened (PCM, AMR, etc…).

16.3. +KECALLCFG: Emergency Call Configuration

Description

KECALLCFG command is used to configure some fields of the MSD.

As the configuration is stored in EEPROM, it is not reset on every occasion that the module/NAD is powered on.

To be sure that the transmission and the stored data are correct, the set command returns the parameters that have been sent in the response.

RQT_SSW_ECALL-AT_0002_01

RQT_END

RQT_SSW_ECALL-AT_0003_01

RQT_END

RQT_SSW_ECALL-AT_0004_01

If the GNSS current position is provided, the recent positions n-1 and n-2 should also be provided. If they are not provided the module/NAD sets their values to 0.

RQT_END

Syntax

RQT_SSW_ECALL-AT_0005_01

AT+KECALLCFG : Configure information sent during an emergency call (ECall)	**HiLoV2 HiALL NC HiLoNC3GPS only**
Test command Syntax **AT+KECALLCFG=?**	Response +KECALLCFG: 1, (list of supported **<vehicle_type>**), **<VIN>**, (list of supported **<propulsion_storage>**) +KECALLCFG: 2, (number of passenger) **<Nb of passenger>** +KECALLCFG: 3, **<Current Latitude>**, **<Current Longitude>**, **<Current Direction>**, **<Confidence> [**, **<Recent Latitude n-1>**, **<Recent Longitude n- 1> [**, **<Recent Latitude n-2>**, **<Recent Longitude n-2>]]** +KECALLCFG: 4, (value of the timer) **<T-EA1>** +KECALLCFG: 5, (value of object identifier) **<OID>, <Additional_Data>** **OK**
Read command Syntax **AT+KECALLCFG?**	Response **+KECALLCFG: 1, <vehicle_type>,<VIN>,<propulsion_storage>** **+KECALLCFG: 2, <Nb of passenger>** **+KECALLCFG: 3, <Current Latitude>,<Current Longitude>,<Current Direction>,<Confidence>,<Recent Latitude n-1>,<Recent Longitude n-1>,<Recent Latitude n-2>,<Recent Longitude n-2>** **+KECALLCFG: 4, <T-EA1>** **+KECALLCFG: 5, <OID>,<Additional_data>** **OK**
Write command Syntax **AT+KECALLCFG=1, [,[<vehicle_type>[,[<VIN> [,[<propulsion_storage>]]]]]]** **AT+KECALLCFG=2, <Nb of passenger>** **AT+KECALLCFG=3, <Current Latitude>, <Current Longitude>, <Current Direction>, <Confidence>, [,[<Recent Latitude n-1> [,[<Recent Longitude n-1>** **[,[<Recent Latitude n-2>** **[,[<Recent Longitude n-2>** **]]]]]]]]** **AT+KECALLCFG=4, <T-EA1>** **AT+KECALLCFG=5,<OID>,<Additional_data>**	Response If AT+KECALLCFG=1 is used: **+KECALLCFG: <vehicle_type>,<VIN>,<propulsion_storage>** **OK** If AT+KECALLCFG=2 is used: **+KECALLCFG: <Nb of passenger>** **OK** If AT+KECALLCFG=3 is used: **+KECALLCFG: <Current Latitude>,<Current Longitude>,<Current Direction>,<Confidence>,<Recent Latitude n-1>,<Recent Longitude n-1>,<Recent Latitude n-2>,<Recent Longitude n-2>** **OK** If AT+KECALLCFG=4 is used: **+KECALLCFG: <T-EA1>** **OK** If AT+KECALLCFG=5 is used: **+KECALLCFG: <OID>,<Additional_data>** **OK**

AT+KECALLCFG : Configure information sent during an emergency call (ECall) **HiLoV2 HiALL NC HiLoNC3GPS only**

Write command

Syntax

AT+KECALLCFG=1, [,[<vehicle_type>[,[<VIN>[,[<propulsion_storage>]]]]]]

AT+KECALLCFG=2, <Nb of passenger>

AT+KECALLCFG=3, <Current Latitude>, <Current Longitude>, <Current Direction>, <Confidence>, [,[<Recent Latitude n-1>[,[<Recent Longitude n-1>[,[<Recent Latitude n-2>[,[<Recent Longitude n-2>]]]]]]]]

AT+KECALLCFG=4, <T-EA1>

AT+KECALLCFG=5,<OID>,<Additional_data>

Parameters

<vehicle_type>: integer type:

1 passenger vehicle (class M1)
2 buses and coaches (class M2)
3 buses and coaches (class M3)
4 light commercial vehicles (class N1)
5 heavy duty vehicles (class N2)
6 heavy duty vehicles (class N3)
7 motorcycles (class L1e)
8 motorcycles (class L2e)
9 motorcycles (class L3e)
10 motorcycles (class L4e)
11 motorcycles (class L5e)
12 motorcycles (class L6e)
13 motorcycles (class L7e)

If omitted no action on vehicle type configuration

<VIN>: string type of 17 characters, Vehicle identification number according to ISO 3779. It consists of the World Manufacturer Index (WMI), the Vehicle Type Descriptor (VDS) and the Vehicle Identification Sequence (VIS)

If omitted no action on VIN configuration

<propulsion_storage>: integer type; to set several type sum up the values:

1 gasoline tank
2 diesel tank
4 compress natural gas (CNG)
8 liquid propane gas (LPG)
16 electric energy storage (with more than 42V and 100 Ah)
32 hydrogen storage

If omitted no action on test mode configuration

<NB of passenger>: integer type, minimum known number of fastened seatbelts, to be set to the default value of 255 if no information available.

<Current Latitude>: string type, Latitude as extracted from NMEA frame (format: ddmm.mmmmmm,[N|S])

<Current Longitude>: string type, Longitude as extracted from NMEA frame (format: ddmm.mmmmmm,[E|W])

<Current Direction>: integer type, Direction of travel in 2°degrees steps from magnetic north (0-358, clockwise)

<Confidence>: integer type

1 = Position can be trusted
0 = No confidence in position

<Recent Latitude n-1>: string type, Latitude Delta with respect the <Current Latitude> (format: m.mmmmmm,[N|S])

<Recent Longitude n-1>: string type, Longitude Delta with respect the <Current Longitude> (format: m.mmmmmm,[E|W])

<Recent Latitude n-2>: string type, Latitude Delta with respect the <Recent Latitude n-1> (format: m.mmmmmm,[N|S])

AT+KECALLCFG : Configure information sent during an emergency call (ECall)	**HiLoV2 HiALL NC HiLoNC3GPS only**
	<Recent Longitude n-2>: string type, Longitude Delta with respect the <Recent Longitude n-1> (format: m.mmmmmm,[E|W]) **<T-EA1>:** integer type Value of the Timer T-EA1 in ms. The default value is 2000 (2 seconds) **<OID>:** integer type, Object identifier which uniquely identifies the format and meaning of the data which follows 1: always equal to 1 until the end of development **<Additional_data>:** string type of 96 characters max, transparent additional data
Reference Sierra Wireless Proprietary	Notes • Default configuration is vehicle_type = 1, VIN =0, propulsion_storage=1 • Up to 6 digits after the dot can be used for latitude and longitude values for the set command. Nevertheless, values returned by the read command are truncated to significant digits for the MSD Current latitude and current longitude formats returned by read command are truncated to 4 digits after the dot Recent latitude and recent longitude formats returned by read command are truncated to 2 digits after the dot • The positions (current, n-1, n-2) answered by AT+KECALLCFG? are coming from previous AT+KECALLCFG=3 set commands and NOT from built-in GNSS • HiLoNC3GPS default values are: AT+CALLCFG? +KECALLCFG: 1, 1, "00000000000000000", 1 +KECALLCFG: 2, 255 +KECALLCFG: 3, "0.00,N", "0.00,E", 0, 0, "0.00,N", "0.00,E", "0.00,N", "0.00,E" +KECALLCFG: 4, 0 OK
Example	Given <vehicle_type>: passenger vehicle (class M1) <VIN>: AAAAAAAAAAAAAAAA <propulsion_storage>: diesel tank <Nb of passenger>: 3 <Current Latitude>: 48°49.35' North <Current Longitude>: 2°33.37’ East <Current Direction>: 14°degrees steps from magnetic north <Confidence>: Position can be trusted <Recent Latitude n-1>: 0.28’ North of Current Latitude <Recent Longitude n-1>: 0.13’ East of Current Longitude <Recent Latitude n-2>: 0.04’ South of Recent Latitude n-1 <Recent Longitude n-2>: 0.07’ West of Recent Longitude n-1 <T-EA1> is 2 seconds <OID>:1 <Additional_data>: BBBBBBBBBBBBBBBBBBBBBB

AT+KECALLCFG : Configure information sent during an emergency call (ECall)	HiLoV2 HiALL NC HiLoNC3GPS only
Example	AT+KECALLCFG? +KECALLCFG: 1,1,"AAAAAAAAAAAAAAAAA",2 +KECALLCFG: 2,3 +KECALLCFG: 3,"4849.35,N","233.37,E",14,0,"0.28,N","0.13,E","0.04,S","0.07,W" +KECALLCFG: 4,2000 +KECALLCFG: 5,1,"BBBBBBBBBBBBBBBBBBBBBB" OK Set the Vehicle type, VIN and propulsion storage: (light commercial vehicles class N1, liquid propane gas) AT+KECALLCFG=1,4, "AAAAAAAAAAAAAAAAA",8 +KECALLCFG: 4, "AAAAAAAAAAAAAAAAA",8 OK Set the number of passengers: AT+KECALLCFG=2,3 +KECALLCFG: 3 OK Set Timer T-EA1: AT+KECALLCFG=4,1500 +KECALLCFG: 1500 OK Set Optional Additional Data: AT+KECALLCFG=5,1,"BBBBBBBBBBBBBBBBBBBBBB" +KECALLCFG: 1,"BBBBBBBBBBBBBBBBBBBBBB" OK

RQT_END

16.4. +KECALL: Initiate Emergency Call

Description

KECALL command is used to dial an eCall emergency call.

About the MSD to be sent during eCall (+KECALL or +KAECALL):

Considering a module/NAD with built-in GNSS:

- If the KECALLCFG=3 command is used, the GNSS positions provided replace the ones coming from the built-in GNSS. This is true until the next module reboot.
- If the KECALLCFG=3 command is not used, the GNSS positions comes from the built-in GNSS.

The fields “recent vehicle location n-1” and ”recent vehicle location n-2” are the last 2 positions saved in the dynamic memory by the command AT+KGNSSHIST (see AT commands document for built-in GNSS). If the command AT+KGNSSHIST does not save the positions, the fields “recent vehicle location n-1” and ”recent vehicle location n-2” are set to 0 in the MSD

It is recommended not to send demanding AT commands (such as AT+KECALLMSD) before end of eCall (URC +KECALL: 13 received) else some notifications may be missing.

Moreover, no new AT+KECALL request must be sent if a previous eCall is not terminated yet (See notifications for “end of ecall” in +KECALL command description)

Syntax

RQT_SSW_ECALL-AT_0006_01

AT+KECALL : Initiate an emergency call (ECall)	**HiLoV2 HiALL NC HiLoNC3GPS only**
Test command Syntax **AT+KECALL=?**	Response **+KECALL:** (list of supported **<test mode>),[<number>][,[<activation mode>],[<call mode>]]** **OK**
Read command Syntax **AT+KECALL?**	Response **OK**
Write command Syntax **AT+KECALL=<test_mode>,[<number>][,[<activation mode>[,[call mode]]]**	Response **OK** **+KECALL: <status>** Parameters **<test_mode>:** 0 Deactivate test mode 1 Activate test mode **<number>:** string type Emergency number to dial. If omitted, dial number 112 **< activation mode>:** integer type: 0 manual activation 1 Automatic activation. If omitted default value is 1 **<call mode>:** integer type: 1 push mode. If omitted default value is 1

AT+KECALL : Initiate an emergency call (ECall)	**HiLoV2 HiALL NC HiLoNC3GPS only**
Unsolicited Notification	**+KECALL: <status>** **<status>:** integer type 1 Calling PSAP 2 Call has been picked up (by PSAP) 3 PUSH message sent to PSAP 4 "Send MSD" message received 5 "LL-ACK" message has been received 6 "AL-ACK" message received, issued by module/NAD when the "AL-ACK" has been received 7 "Clear down" request received: "AL-ACK" received with status="transaction ended" : End of eCall 11 No network. There is no network coverage : End of eCall 12 Call drop. Internal Network error : End of eCall 13 The PSAP has ended the call : End of eCall 14 An eCall is already in progress : End of eCall 21 Busy. The PSAP line is busy : End of eCall 41 “Send MSD” message reception timed out: "Send MSD" message not received before T5 expiry: switch to audio call. 42 Timer T-EA1 timed out: PSAP has required to send the MSD message but no new position has been received from the external GNSS (from the command +KECALLCFG=3…) before T-EA1 expiry so the previous GNSS position is used. This timer is used only when the PSAP asks to resend the MSD.
Unsolicited Notification	51 "LL-ACK" message reception timed out: no "LL-ACK" received before T7 expiry: switch to audio call. 61 "AL-ACK" message reception timed out: no "AL-ACK" received before T6 expiry: switch to audio call. 71 Call Clear down timed out: triggered by the T2 expiry : End of eCall
Reference Sierra Wireless Proprietary	Notes When AT+KECALL is used all the **voice and CSD calls are automatically terminated**
Example	**1- A normal eCall on the AT interface** AT+KECALL=0,”112”,1 OK +KECALL: 1 (*the module/NAD is calling the PSAP*) +KECALL: 2 (*call is established*) +KECALL: 3 (*the module/NAD sends the PUSH message*) +KECALL: 4 (*the module/NAD has received the "Send MSD" order*) +KECALL: 5 +KECALL: 6 +KECALL: 7 (*end of eCall the "AL-ACK" "Clear down" request has been received*) **2- An Ecall with no network coverage** AT+KECALL=0,”112”,1 OK +KECALL: 11 (*End of eCall, use AT+KECALL to retry*)

AT+KECALL : Initiate an emergency call (ECall)	HiLoV2 HiALL NC HiLoNC3GPS only
Example	**3- The PSAP hangs up** AT+KECALL=0,”112”,1 OK +KECALL: 1 (*the module/NAD is calling the PSAP*) +KECALL: 2 (*call is established*) +KECALL: 3 (*the module/NAD sends the PUSH message*) +KECALL: 13 (*End of eCall, use AT+KECALL to retry*) **4- “Send MSD” message reception timed out** AT+KECALL=0,”112”,1 OK +KECALL: 1 (*the module/NAD is calling the PSAP*) +KECALL: 2 (*call is established*) +KECALL: 3 (*the module/NAD sends the PUSH message*) +KECALL: 41 (*the module/NAD did not receive the “Send MSD” order, the module/NAD switches to a normal audio call*) +KECALL: 13 (*End of eCall, the PSAP has ended the call*) **5- Use an external GNSS and PSAP asks to resend the MSD twice** AT+KECALLCFG=3,”4849.35,N”,”233.37,E”,14,0,”0.28,N”,”0.13,E”,”0.04,S”,”0.07,W” +KECALLCFG: “4849.35,N”,”233.37,E”,14,0,”0.28,N”,”0.13,E”,”0.04,S”,”0.07,W” OK AT+KECALLCFG=4,2000 +KECALLCFG: 2000 OK AT+KECALL=0,”112”,1 OK +KECALL: 1 +KECALL: 2 +KECALL: 3 +KECALL: 4 +KECALL: 5 +KECALL: 6 +KECALL: 4 AT+KECALLCFG=3,”4849.55,N”,”233.00,E”,14,0,”0.28,N”,”0.13,E”,”0.04,S”,”0.07,W” +KECALLCFG: “4849.35,N”,”233.37,E”,14,0,”0.28,N”,”0.13,E”,”0.04,S”,”0.07,W” OK +KECALL: 5 +KECALL: 6 +KECALL: 4 +KECALL: 42 +KECALL: 5 +KECALL: 6 +KECALL: 7

16.5. +KAECALL: Answer an Emergency Call

Description

KAECALL command is used to answer to an incoming eCall coming from the PSAP. The PSAP can ask to the module/NAD to send an MSD.

For more information about the MSD sent during an eCall, see 16.4 AT+KECALL command.

Syntax

RQT_SSW_ECALL-AT_0007_01

AT+KAECALL : Answer an emergency call (eCall)	**HiLoV2 HiALL NC HiLoNC3GPS only**
Test command Syntax **AT+KAECALL=?**	 Response **OK**
Read command Syntax **AT+KAECALL?**	 Response **OK**
Write command Syntax **AT+KAECALL**	 Response **OK** **+KECALL: <status>**
Unsolicited Notification	**+KECALL: <status>** **<status>:** integer type Same values as +KECALL command
Reference Sierra Wireless Proprietary	Notes
Example	**A PSAP call the module/NAD** RING (incoming call coming from the PSAP) RING AT+KAECALL OK +KECALL: 4 (the module/NAD has received the “Send MSD” order) +KECALL: 5 +KECALL: 6 +KECALL: 7

16.6. +KECALLMSD: MSD Configuration

Description

KECALLMSD command returns the last MSD generated.

The MSD is stored in a non-volatile memory so that it can be read after a reboot.

Syntax

RQT_SSW_ECALL-AT_0008_01

AT+KECALLMSD : Returns the last MSD sent by the module/NAD **HiLoV2 HiAIINC HiLoNC3GPS only**	
Test command Syntax **AT+KECALLMSD=?**	 Response **+KECALLMSD:** (list of supported **<mode>**s) **OK**
Read command Syntax **AT+KECALLMSD?**	 Response **OK**
Write command Syntax **AT+KECALLMSD= <mode>**	 Response **+ KECALLMSD: <MSD>** **OK** **<mode>:** integer type: 0 MSD is returned coded according to the standard (e.g. ASN.1) 1 MSD is returned not coded **<MSD>:** string type, MSD in hexadecimal format (Big endian)
Reference Sierra Wireless Proprietary	Notes The MSD is stored in Non-volatile memory so it can be read even after a reboot
Example	**6- Return the last MSD sent** AT+KECALLMSD=1 + KECALLMSD: ”A0B45894914F4……DF991” OK

16.7. +KECALLVSN: Emergency Call Version

Description

KECALLVSN command returns the ECall stack and ASN.1 versions used in the module/NAD.

Syntax

RQT_SSW_ECALL-AT_0009_01

AT+KECALLVSN : returns ECall stack and ASN.1 version HiLoV2 HiALL NC HiLoNC3GPS only	
Test command Syntax **AT+KECALLVSN=?**	 Response **OK**
Read command Syntax **AT+KECALLVSN?**	 Response **+ KECALLVSN: <Ecall Version>,<ASN.1 Version>** **OK** <**Ecall Version>,<ASN.1 Version>:** string type
Write command **No write command**	 **No write command**
Reference Sierra Wireless Proprietary	Notes
Example	**Ecall version used** AT+KECALLVSN? + KECALLVSN: ”10.0.0”, ”15722:2011” OK

17. GNSS commands

Those commands are supported only on HiAll NC

17.1. Introduction

Some DTE wants to receive NMEA frames from the module. This document describes the AT commands for requiring NMEA frames to the modules.

17.2. References

[1] 3GPP 27.007 (6.0.0) - AT command set for User Equipment (UE) (Release 6)

[2] ITU-T Recommendation V.25 ter - Serial asynchronous automatic dialing and control

[3] SiRF – NMEA Reference Manual

17.3. NMEA frames

Description

Each frame begins with a '$' and ends with a carriage return/line feed sequence and can be no longer than 80 characters of visible text (plus the line terminators). The data is contained within this single line with data items separated by commas. The data itself is ascii. There is a provision for a checksum at the end of each sentence. The checksum field consists of a '*' and two hex digits representing an 8 bit exclusive OR of all characters between, but not including, the '$' and '*'. A checksum is required on some sentences.

Examples

- RMC frames give Time, data, position, course and speed data:

$GPRMC,123519,A,4807.038,N,01131.000,E,022.4,084.4,230394,003.1,W*6A

Where:

RMC	Recommended Minimum sentence C
123519	Fix taken at 12:35:19 UTC
A	Status A=active or V=Void
4807.038,N	Latitude 48 deg 07.038' N
01131.000,E	Longitude 11 deg 31.000' E
022.4	Speed over the ground in knots
084.4	Track angle in degrees True
230394	Date - 23rd of March 1994
003.1,W	Magnetic Variation
*6A	The checksum data, always begins with *

- GGA frames give time, position and fix type data:

$GPGGA,123519,4807.038,N,01131.000,E,1,08,0.9,545.4,M,46.9,M,,*47

Where:

GGA	Global Positioning System Fix Data
123519	Fix taken at 12:35:19 UTC
4807.038,N	Latitude 48 deg 07.038' N
01131.000,E	Longitude 11 deg 31.000' E
1	Fix quality: 0 = invalid, 1 = GNSS fix (SPS)
08	Number of satellites being tracked
0.9	Horizontal dilution of position
545.4,M	Altitude, Meters, above mean sea level
46.9,M	Height of geoid (mean sea level) above WGS84
(empty field)	time in seconds since last DGPS update
(empty field)	DGPS station ID number
*47	the checksum data, always begins with *

17.4. +KGNSSRUN: Start/Stop GNSS

Description

When the Terminal Equipment wants to start the GNSS, it sends AT+KGNSSRUN=1 to the module.

To Stop the GNSS, the Terminal Equipment sends AT+KGNSSRUN=0.

When the GNSS stops, the module sends the unsolicited notification +KGNSSRUN: 0.

If the GNSS uses a simulator and not real satellites, the command to start the GNSS is AT+KGNSSRUN=1,1

Syntax

AT+KGNSSRUN : Start/Stop GNSS feature	**HiALL NC HiLoNC3GPS only**
Test command Syntax **AT+KGNSSRUN=?**	 Response **+KGNSSRUN:** (list of supported **<mode>**s**) [,<simulator>] [,<lna ext>] [,pps output] [,boot mode]** **OK**
Read command Syntax **AT+KGNSSRUN?**	 Response **+KGNSSRUN: <mode>, boot mode** **OK**

AT+KGNSSRUN : Start/Stop GNSS feature	**HiALL NC HiLoNC3GPS only**
Write command Syntax **AT+KGNSSRUN=<mode> [,<simulator>] [,<lna ext>] [,<pps output>] [,boot mode]**	Response **OK** Parameters **<mode>:** 0 Stop GNSS feature 1 Run GNSS engine for periodic position update (1 Hz) 2 Run GNSS engine for one fix **<simulator>:** 0 normal mode – enable all stored almanac 1 simulator mode – disable ROM almanac 2 simulator mode – disable all stored almanac **<lna ext>:** 0 Passive antenna 1 Active antenna or external LNA **<pps output>:** 0 disable PPS output (only for HiAllNC) 1 enable PPS output (only for HiAllNC) **<boot mode>:** 0 GNSS feature not started automatically after boot 1 GNSS feature started automatically after boot 2 GNSS feature keep previous status after boot
Unsolicited Notification	**+KGNSSRUN: 0** indicate GNSS engine has stopped **+KGNSSRUN: 1** indicate GNSS engine is started for periodic position update **+KGNSSRUN: 2** indicate GNSS engine is started for a single fix
Reference Sierra Wireless SA Proprietary	• The AT commands KGNSSRUN and KGNSSRST cannot be run at the same time • If retrieved from GNSS constellation, GNSS Ephemeris, almanac, and position can speed up the next GNSS fix. For that purpose, Ephemeris, almanac, and position need to be saved in NV memory by AT+KGNSSRUN=0 prior to any module switch off and will be taken into account at next AT+KGNSSRUN=1 • If GNSS is already started, a new Start request by AT+KGNSSRUN=1 will result in an error URC: GNSS must be stopped before any Start request • The value of <boot mode> is not changed if it is not explicitly specified in the command Examples AT+KGNSSRUN=? +KGNSSRUN: (0-2) OK **Run GNSS :** AT+KGNSSRUN=1 +KGNSSRUN: 1 OK AT+KGNSSRUN? ++KGNSSRUN: 1, 0

AT+KGNSSRUN : Start/Stop GNSS feature	HiALL NC HiLoNC3GPS only
Reference Sierra Wireless SA Proprietary	OK **Stop GNSS :** AT+KGNSSRUN=0 +KGNSSRUN: 0 OK AT+KGNSSRUN? +KGNSSRUN: 0, 0 OK **Run for one fix :** AT+KGNSSRUN=2 +KGNSSRUN: 2 OK +KGNSSRUN: 0 **Run GNNS and set boot mode :** AT+KGNSSRUN? +KGNSSRUN: 0, 0 OK AT+KGNSSRUN=1,,,,1 ==> Set a boot mode +KGNSSRUN: 1 OK AT+KGNSSRUN? +KGNSSRUN: 1, 1 ==> Verify the boot mode OK AT+KGNSSRUN=0 +KGNSSRUN: 0 OK AT+KGNSSRUN? +KGNSSRUN: 0, 1 ==> Boot mode is not changed OK AT+KGNSSRUN=1

AT+KGNSSRUN : Start/Stop GNSS feature	HiALL NC HiLoNC3GPS only
Reference Sierra Wireless SA Proprietary	+KGNSSRUN: 1 OK AT+KGNSSRUN? +KGNSSRUN: 1, 1 ==> Boot mode is not changed OK AT+KGNSSRUN=0,,,,0 <== Change the boot mode +KGNSSRUN: 0 OK AT+KGNSSRUN? +KGNSSRUN: 0, 0 ==> Boot mode is changed OK

17.5. +KNMEARCV: Receive NMEA Frames

Description

When the Terminal Equipment wants to receive NMEA frames from the module, it sends AT+KNMEARCV=1 to the module. Once the module answers CONNECT, it sends the NMEA frames.

To stop receiving NMEA frames, the Terminal Equipment first switches to command mode by sending the string '+++' or DTR drop and then sends AT+KNMEARCV=0.

Syntax

AT+KNMEARCV : Receive NMEA frames	HiALL NC HiLoNC3GPS only
Test command Syntax **AT+KNMEARCV=?**	 Response **+KNMEARCV:** (list of supported **<mode>**s), (list of supported **<uart/fs>**s), (list of supported values for **<maxsize>**) **OK**
Read command Syntax **AT+KNMEARCV?**	 Response **+KNMEARCV: <mode>, <uart/fs>, <maxsize>** **OK**

<table>
<tr><th colspan="2">AT+KNMEARCV : Receive NMEA frames HiALL NC HiLoNC3GPS only</th></tr>
<tr><td>Write command

Syntax
AT+KNMEARCV=<mode>
, <uart/fs>[, <maxsize>]</td><td>Response
OK if <uart/fs>=1
CONNECT if +KUARTCFG=1 and <uart/fs>=0

Parameters
<mode>: 0 Deactivate sending NMEA frames
1 Activate sending standard NMEA frames
2 Activate sending standard + proprietary NMEA frames

<uart/fs>: 0 Send NMEA frames to UART0 or UART1 depending on KUARTCFG
1 Save NMEA frames in file system (/gps/nmea.txt)

<maxsize>:
maximum size allowed to write NMEA file in File System (value in bytes, 10000 by default)
The lower limit is arbitrarily set at 10,000 bytes - This can store about 150 NMEA frames
The upper limit is determined by the remaining size in file system. (in fact 90% of remaining size in file system)
AT+KFSFILE=4,"/gps"

+KFSFILE: <F> gps_data.db 2342
+KFSFILE: 1308446 bytes free

OK
AT+KNMEARCV=?

+KNMEARCV: (0-2), (0-1), (10000-1177601)

OK</td></tr>
<tr><td>Reference
Sierra Wireless SA Proprietary</td><td>Notes
• After AT+KNMEARCV=1 on UART1, switch to command mode is done either by sending ‘+++’ string or by DTR drop in AT&D1 configuration. Return in NMEA flow is done with ATO
• When switching back to command mode on UART1, the last 60 NMEA frames are buffered
• Error is return if < maxsize> greater than available size in File System
• NMEA frames are written in a file in a specific directory (/gps/nmea.txt). File is handled in FIFO mode if size exceeds the maximum specified size. At each launch of AT+KNMEARCV=1,1,XXX (storage in FS), values are appended in nmea.txt with respect of the maximum specified size

Example :

Start GNSS:
AT+KGNSSRUN=1

+KGNSSRUN: 1

OK</td></tr>
</table>

AT+KNMEARCV : Receive NMEA frames	**HiALL NC HiLoNC3GPS only**
Reference Sierra Wireless SA Proprietary	**Activate NMEA RCV:** NMEA on UART0 or UART1 (depending on KUARTCFG): AT+KNMEARCV=1,0 (where 0 stands for **<uart/fs>**) CONNECT ,70,322,21,76,14,319,33,86,05,215,28,66,04,312,22*64 $GPGSA,A,3,02,04,12,14,,,,,,,,,8.0,4.5,6.5*38 $GNGSA,A,3,02,04,12,14,,,,,,,,,8.0,4.5,6.5*26 …… **Deactivate NMEA RCV:** If NMEA sent on UART1: Send '+++' or DTR drop on UART1 OK If NMEA sent on UART0: Send AT+KNMEARCV=0,0 on UART1 **Activate NMEA RCV:** storage in FS AT+KNMEARCV=1,1 (where 2nd 1 stands for **<uart/fs>**) OK **Deactivate NMEA RCV:** AT+KNMEARCV=0,1 (where 1 stands for **<uart/fs>**) OK **Stop GNSS:** AT+KGNSSRUN=0 +KGNSSRUN: 0 OK

17.6. +KGNSSFIX: GNSS Position Configuration

Description

This command allows activating or deactivating the sending by the module of unsolicited messages which indicate whereas the GNSS has done a fix or if it has lost it.

Using this command, the Terminal Equipment can request the module the current GNSS position or the last valid GNSS position.

Syntax

AT+KGNSSFIX : Get information about GNSS fix	**HiALL NC HiLoNC3GPS only**
Test command Syntax **AT+KGNSSFIX=?**	 Response **+KGNSSFIX:** (list of supported **<mode>**s), (list of supported **<pos_type>**s) **OK**

AT+KGNSSFIX : Get information about GNSS fix	**HiALL NC HiLoNC3GPS only**
Read command Syntax **AT+KGNSSFIX?**	 Response **+KGNSSFIX: <mode>,<fix>** **OK** Stored <mode> is either 0 or 1 (never 2)
Write command Syntax **AT+KGNSSFIX =<mode>[,<pos_type>]**	 Response **+KGNSSFIX: <fix>,<UTC time>, <UTC date>, <latitude><N/S>, <longitude><E/W>, <speed>, <direction>, <Magnetic Variation><E/W>, <altitude>, <NbOfSatelliteInUse>, <NbOfSatelliteInView>,<SNR min>,<SNR max>,<SNR avg>, <PDOP>, <HDOP>, <VDOP>, <QualityIndicator>** **OK** Parameters **<mode>:** 0 deactivate sending of +KGNSSFIX URC 1 activate sending of +KGNSSFIX URC 2 Require GNSS position information **<pos_type>:** for <mode>=2, information on: 0 current position 1 last position valid 2 last -1 position valid 3 last -2 position valid **<fix>:** 0 GNSS is not fixed 1 GNSS is fixed **<UTC time>** UTC time of position hhmms **<UTC date>** UTC data of position ddmmyy **<latitude>** latitude in ddmm.mmmm **<N/S>** North or South indicator **<longitude>** longitude in dddmm.mmmm **<E/W>** East or West indicator **<speed>** speed over ground in knots **<direction>** course over ground in true degrees **<Magnetic Variation>** magnetic variation in degrees **<altitude>** altitude in meters **<NbOfSatelliteInUse>** number of satellites in use **<NbOfSatelliteInView>** number of satellites in view **<SNR min>** minimum SNR of satellites in use in dB-Hz **<SNR max>** maximum SNR of satellites in use in dB-Hz **<SNR avg>** average SNR of satellites in use in dB-Hz **<PDOP>** Positional dilution of position **<HDOP>** Horizontal dilution of position **<VDOP>** Vertical dilution of position **<QualityIndicator>** 0-8 possible value

AT+KGNSSFIX : Get information about GNSS fix	**HiALL NC HiLoNC3GPS only**
Unsolicited Notification	**+KGNSSFIX: <fix>**
Reference *Sierra Wireless SA Proprietary*	Note • In case of <mode>=2, a valid position is a fixed position The last/-1/-2 position are refreshed every sec and stored in a volatile memory. • <mode> value is stored in nonvolatile memory (value kept after reboot) • $SNR_avg = 10 * LOG_{10}(\frac{1}{n}\sum_{i=1}^{n} 10^{\frac{SNRi}{10}})$ • Quality indictor : 0 = fix not available or invalid 1 = GPS SPS mode 2 = differential GPS, SPS mode 3 = GPS PPS mode 4 = Real Time Kinematic. Satellite system used in RTK mode with fixed integers 5= Float RTK. Satellite system used in RTK mode with floating solution 6= Estimated (dead reckoning) mode 7= Manual input mode 8 = Simulator mode

AT+KGNSSFIX : Get information about GNSS fix	HiALL NC HiLoNC3GPS only
Reference Sierra Wireless SA Proprietary	**Example** **Mode = 1:** AT+KGNSSFIX=1 OK AT+KGNSSRUN=1 +KGNSSRUN: 1 OK +KGNSSFIX: 0 +KGNSSFIX: 1 AT+KGNSSFIX? +KGNSSFIX: 1, 1 OK **Mode = 2:** AT+KGNSSFIX=2 +KGNSSFIX: 1,101411,170113,4849.9391N,00216.0597E,000.0,233.0,,78.36,14,20,16,48,42,2.8,2.0,2.0,1 OK AT+KGNSSFIX=2,1 +KGNSSFIX: 1,101419,170113,4849.9391N,00216.0597E,000.0,233.0,,77.96,13,20,24,48,42 ,3.5,1.7,3.0,1 OK

17.7. +KGNSSRST: GNSS Reset

Description

To allow cold/warm/hot- GNSS resets, using the following definitions:

- **"Factory"** - Repetitive factory starts, all stored GNSS data is discarded before each start.
- **"Cold_Starts"** - Repetitive cold starts, all stored GNSS data is discarded before each start except stored oscillator.
- **"Warm_Starts"** - Repetitive warm starts, stored ephemeris data is discarded before each start; this simulates GNSS receiver start after it was left off for more than 4 hours.
- **"Hot_Starts"** - Repetitive hot starts.
- **"Stop"** – Stop a running repetitive RST.

Note: This command is not used to perform a reset of GNSS running but for statistical purposes.

Syntax

AT+KGNSSRST : Force specific reset of GNSS	**HiALL NC HiLoNC3GPS only**
Test command Syntax **AT+ KGNSSRST =?**	Response **+ KGNSSRST:** (list of supported) **<reset>**, (number of repeat) **<repeat>**, (list of supported) **<simulator>** **OK**
Read command Syntax **AT+ KGNSSRST?**	Response **+ KGNSSRST: < reset >,<repeat>,<simulator>** **OK**
Write command Syntax **AT+KGNSSRST =** **< reset >[,<repeat> [,<simulator>]]**	Response **CONNECT** Parameters **<reset>:** 0 : Cold Start 1 : Warm Start 2 : Hot Start 3 : Factory Start 4: Stop **<repeat>:** 0 to 9999 (0 for continuous mode) **<simulator>:** 0 : normal mode 1 : simulator mode – disable ROM almanac
Reference Sierra Wireless SA Proprietary	Notes • Proprietary and standard NMEA frames are sent on the UART selected by KUARTCFG • The AT commands KGNSSRUN and KGNSSRST cannot be run at the same time • In continuous mode (repeat set to 0) or repeat mode reset =0 stop the KGNSSRST command • AT+KGNSSRST? returns the last values set **Example** AT+KGNSSRUN=0 ==> to be sure GNSS is not running OK **Case : Hot Start repeat 5 times on UART 1** AT+KUARTCFG=1 OK AT+KGNSSFIX=1 OK AT+KGNSSRST=2,5 (Hot Start repeat 5 times)

AT+KGNSSRST : Force specific reset of GNSS	HiALL NC HiLoNC3GPS only
	CONNECT $PGLOR,0,NEW,PERFIX,0,PER,1000,QOP,-1*1E ..... +KGNSSFIX: 1 ..... $PGLOR,0,FIX,32.1*13 $GPRMC,110408.52,A,4851.656375,N,00211.119817,E,,,090512,,,A*53 $PGLOR,2,FIN,0,0,1,0*34
Reference Sierra Wireless SA Proprietary	$PGLOR,0,NEW,PERFIX,0,PER,1000,QOP,-1*1E +KGNSSFIX: 0 ..... +KGNSSFIX: 1 ..... $PGLOR,0,FIX,5.6*20 $GPRMC,110415.10,A,4851.643257,N,00211.106362,E,000.0,,090512,,,E*71 $PGLOR,2,FIN,0,0,1,0*34 $PGLOR,0,NEW,PERFIX,0,PER,1000,QOP,-1*1E +KGNSSFIX: 0 ..... +KGNSSFIX: 1 ..... $PGLOR,0,FIX,5.8*2E $GPRMC,110422.96,A,4851.623558,N,00211.096705,E,000.0,,090512,,,A*7C $PGLOR,2,FIN,0,0,1,0*34 $PGLOR,0,NEW,PERFIX,0,PER,1000,QOP,-1*1E +KGNSSFIX: 0 ..... +KGNSSFIX: 1 ..... $GPRMC,110429.54,A,4851.626561,N,00211.094337,E,000.0,,090512,,,E*75 $PGLOR,2,FIN,0,0,1,0*34 $PGLOR,0,NEW,PERFIX,0,PER,1000,QOP,-1*1E +KGNSSFIX: 0 ..... +KGNSSFIX: 1 ..... $PGLOR,0,FIX,5.6*20 $GPRMC,110435.68,A,4851.590615,N,00211.075198,E,000.0,,090512,,,E*71 $PGLOR,2,FIN,0,0,1,0*34 OK +KGNSSRST: 2,5 Done (Hot Start repeat 5 times)

AT+KGNSSRST : Force specific reset of GNSS	HiALL NC HiLoNC3GPS only
	Case : Hot Start repeat 5 times on UART 0 AT+KUARTCFG=0 OK AT+KGNSSFIX=1 OK
Reference Sierra Wireless SA Proprietary	AT+KGNSSRST=2,5 OK ==> Frame NMEA are sent on UART 0 +KGNSSFIX: 1 ==> Frame NMEA are sent on UART 0 +KGNSSFIX: 0 ==> Frame NMEA are sent on UART 0 +KGNSSFIX: 1 ==> Frame NMEA are sent on UART 0 +KGNSSFIX: 0 ==> Frame NMEA are sent on UART 0 +KGNSSFIX: 1 ==> Frame NMEA are sent on UART 0 +KGNSSFIX: 0 ==> Frame NMEA are sent on UART 0 +KGNSSFIX: 1 ==> Frame NMEA are sent on UART 0 +KGNSSFIX: 0 ==> Frame NMEA are sent on UART 0 +KGNSSFIX: 1 ==> Frame NMEA are sent on UART 0 OK +KGNSSRST: 2,5 Done (Hot Start repeat 5 times) **Case : Hot Start repeat 100 times on UART 0 and stop during repeat** AT+KGNSSRST=2,100 OK AT+KGNSSRST=4,0 NO CARRIER

AT+KGNSSRST : Force specific reset of GNSS	HiALL NC HiLoNC3GPS only
	+KGNSSRST: 2,10 Done (Hot Start repeat 10 times)

17.8. +KGNSSHIST: GNSS Position Storage

Description

For saving position in ram and file system.

The positions saved by this command come from the built-in GNSS (and not from any external GNSS information such as the ones set by +KECALLCFG=3).

Syntax

<table>
<tr><th colspan="2">AT+KGNSSHIST : Save GNSS position history in file system HiALL NC HiLoNC3GPS only</th></tr>
<tr><td>Test command

Syntax
AT+KGNSSHIST=?</td><td>

Response
+ KGNSSHIST: (range of supported nbPosition), (range of supported SavingPeriodInRam), (range of supported SavingPeriodInFS), <Append>
OK</td></tr>
<tr><td>Read command

Syntax
AT+ KGNSSHIST?</td><td>

Response
+ KGNSSHIST: current nb Position,
Current value for SavingPeriodInRam
Current value for SavingPeriodInFS
Current mode for Append

OK</td></tr>
<tr><td>Write command

Syntax
AT+ KGNSSHIST =<nbPosition>,<SavingPeriodInRam>[,<SavingPeriodInFS>,[Append]]</td><td>

Response
OK

Parameters
<nbPosition>: Number of history position saved in RAM (0-1000)
0 associated with Saving period stop command saving position

< SavingPeriodInRam >: Period of update history position in RAM in second.
Value 0 stop saving GNSS positions.

< SavingPeriodInFS>: Period of save of all history positions in File System in second.
Value 0 stops saving GNSS positions
Default Value is 0

< Append >: 0: Append mode deactivated – Previous info in FS lost at each new SavingPeriodInFS
1: Append mode activated – Previous info in FS kept (10 000 history positions max)</td></tr>
<tr><td>Reference
Sierra Wireless SA Proprietary</td><td>Notes

Name and location : /gps/PositionHistory.db
This is a Binary file (not ascii) see GNSS position below</td></tr>
</table>

AT+KGNSSHIST : Save GNSS position history in file system	HiALL NC HiLoNC3GPS only
	KGNSSHIST=0,0,[0] stop saving GNSS positions When Append mode is Deactivated: The **nbPosition** GNSS history positions saved in RAM are stored in File System When Append mode is Activated: Append GNSS history positions in file system till 10 000 records. When the 10 000 records have been reached, the first 1000 records will be deleted to allow the following records to be saved till 10 000 records and so on
Reference Sierra Wireless SA Proprietary	==> Run GNSS AT+KGNSSRUN=1 +KGNSSRUN: 1 OK ==> Launch history : 100 positions in RAM, append deactivated AT+KGNSSHIST=100,1,2 OK ==> Read FS AT+KFSFILE=4,"/gps" +KFSFILE: <F> PositionHistory.db 2800 ==> 100 GNSS history +KFSFILE: <F> gps_data.db 15268 +KFSFILE: 1048407 bytes free OK ==> Stop history AT+KGNSSHIST=0,0 OK ==> Launch history : 1000 positions in RAM, append deactivated AT+KGNSSHIST=1000,1,2 OK ==> Read FS AT+KFSFILE=4,"/gps" +KFSFILE: <F> PositionHistory.db 28000 ==> 1000 GNSS history +KFSFILE: <F> gps_data.db 15268 +KFSFILE: 1048407 bytes free ==> Stop history AT+KGNSSHIST=0,0 OK AT+KGNSSHIST=100,1,2,1 ==> 100 positions in RAM, append activated OK ==> Read FS after 220s AT+KFSFILE=4,"/gps" +KFSFILE: <F> PositionHistory.db 3080 ==> 110 GNSS history +KFSFILE: <F> gps_data.db 15268 +KFSFILE: 1048407 bytes free OK

AT+KGNSSHIST : Save GNSS position history in file system	**HiALL NC HiLoNC3GPS only**
	==> Read FS after 9' 12" AT+KFSFILE=4,"/gps" +KFSFILE: <F> PositionHistory.db 8832 ==> 552 GNSS history +KFSFILE: <F> gps_data.db 15268 +KFSFILE: 1048407 bytes free OK

GNSS Position is a structure described below:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Date				Time				Latitude ddmm signed		Latitude mmmm		Longitude dddmm signed		Longitude mmmmm		Speed *10 xxxx		Uncertainty Positon*10 xxxx		PDOP *10 xxxx		HDOP *10 xxxx		VDOP *10 xxxx		NULL xxxx	

With:

Date format: ddmmyy (in hexa unsigned on 6 digits right justified with zeros)

Time format: ddmmyy (in hexa unsigned on 6 digits right justified with zeros)

Latitude_1 format: ddmm (in hexa signed on 4 digits right justified with zeros, if South(S) then it is negative)

Latitude_2 format: mmmm (in hexa unsigned on 4 digits right justified with zeros)

Longitude_1 format: dddmm (in hexa signed on 5 digits right justified with zeros, if West(W) then it is negative)

Longitude_2 format: mmmm (in hexa unsigned on 4 digits right justified with zeros)

Speed*10 format: xxxx (in hexa unsigned on 4 digits right justified with zeros)

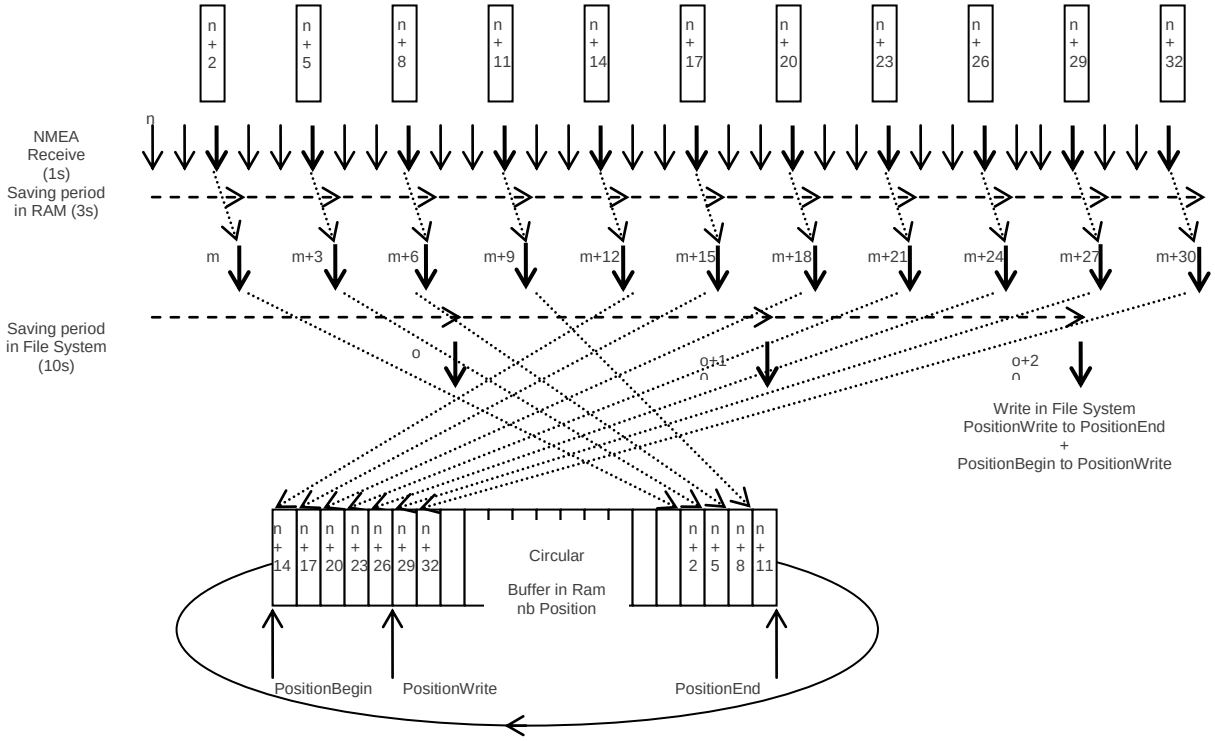
Uncertainty_Position*10 format: xxxx (in hexa unsigned on 4 digits right justified with zeros)

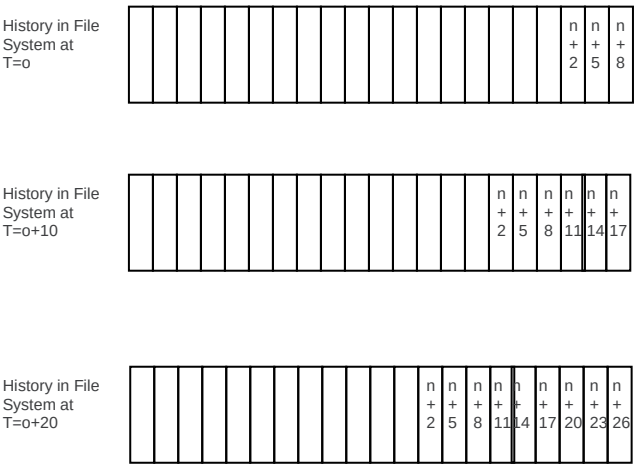
PDOP*10 formats: xxxx (in hexa unsigned on 4 digits right justified with zeros)

HDOP*10 formats: xxxx (in hexa unsigned on 4 digits right justified with zeros)

VDOP*10 formats: xxxx

Saving History Process:





Save history position in file system

17.9. +KGNSSLTOACT: Activate GNSS with LTO

Description

For the Long Time Orbit. (LTO) functionality to operate, the module needs to load the Client-based Extended Ephemeris (CBEE) which is defined for a specific period from a server. See 17.11 AT+KGNSSLTOGET command.

To activate LTO at the next start of the GNSS engine, the Terminal Equipment sends the command AT+KGNSSLTOACT to the module.

Syntax

AT+KGNSSLTOACT : Activation of LTO functionality on next GNSS start	**HiALL NC only**
Test command Syntax **AT+KGNSSLTOACT=?**	 Response **+ KGNSSLTOACT:** (list of supported **<mode>**s,**<urc>**)s **OK**
Read command Syntax **AT+ KGNSSLTOACT?**	 Response **+ KGNSSLTOACT: <mode>,<urc>)** **OK**
Write command Syntax **AT+ KGNSSLTOACT =<mode>**	 Response **OK** Parameters **<mode>:** 0 deactivate LTO 1 activate LTO **<urc>:** 0 deactivate URC 1 activate URC
Reference Sierra Wireless SA Proprietary	Notes See AT+KGNSSLTOGET command to download CBEE file from server This command is an option and it is subject to a commercial offer. Notes The URC is displayed when urc and mode setting are activated. Example: AT+KGNSSLTOACT=1,1 OK + KGNSSLTOACT: 0 ==> PASS + KGNSSLTOACT: 1 ==> FAULT + KGNSSLTOACT: 2 ==> OPEN ERROR + KGNSSLTOACT: 3 ==> READ ERROR + KGNSSLTOACT: 4 ==> WRONG FILE

17.10. +KGNSSLTOCFG: GNSS with LTO Configuration

Description

This command allows the module to configure the connection to the CBEE external server with a configurable URL.

To configure connection parameters, the Terminal Equipment uses the usual AT+KCNXCFG, AT+KCNXTIMER commands.

Syntax

<table>
<tr><th colspan="2">AT+KGNSSLTOCFG : Configuration of LTO functionality HiALL NC only</th></tr>
<tr><td>Test command

Syntax
AT+KGNSSLTOCFG=?</td><td>

Response
+KGNSSLTOCFG: (list of supported <cnx cnf >s)
OK</td></tr>
<tr><td>Read command

Syntax
AT+KGNSSLTOCFG?</td><td>

Response
+KGNSSLTOCFG: <session id>,<status>,<cnx_cnf>,<url server>,<path file>
OK</td></tr>
<tr><td>Write command

Syntax
AT+KGNSSLTOCFG = <cnx cnf>,<url server>,<path file></td><td>

Response
+KGNSSLTOCFG: <session id>
OK

Parameters

<cnx cnf>: [0..7] (PDP context configuration) a numeric parameter which specifies a particular PDP context configuration (see KCNXCFG)

<url server>: string type ; the url server of the CBEE provider

<path file>: string type ; path file as it is located in CBEE server

<session id>: Index of the TCP session

<status>: Connection state of the selected socket (0-1) respectively (disconnected – connected)</td></tr>
<tr><td>Reference
Sierra Wireless SA Proprietary</td><td>Notes
This command must be used before LTO activation by KGNSSLTOACT
This command is an option and it is subject to a commercial offer.

Example
AT+KCNXCFG=0,"GPRS","websfr","",""
OK

AT+KGNSSLTOCFG=0,"gllto.glpals.com","/7day/v2/latest/lto2.dat"
+KGNSSLTOCFG: 1
OK</td></tr>
</table>

17.11. +KGNSSLTOGET: Get CBEE Data for GNSS with LTO

Description

This command allows the module to get CBEE data from an external server (with URL set by AT+KGNSSLTOCFG).

Syntax

AT+KGNSSLTOGET : Get CBEE file from server	**HiALL NC only**
Test command Syntax **AT+KGNSSLTOGET=?**	Response **+KGNSSLTOGET:** (list of supported **<session id>**s) **OK**
Read command Syntax **AT+KGNSSLTOGET?**	Response **+KGNSSLTOGET: <session id>** **OK**
Write command Syntax **AT+KGNSSLTOGET=<session id>**	Response **OK** Parameters **<session id>:** Index of the TCP session returned by +KGNSSLTOCFG **<status>:** 0- disconnected 1- connection in progress 2- connected 3- data download in progress (Error code) 4- DNS error 5- HTTP connection error due to internal trouble 6- HTTP connection timeout 7- Flash access trouble 8- Flash memory full 9- triple plus (+++) error (switch to command mode) 10-HTTP got no data 11-HTTP got partial data
Unsolicited Notification	**+KGNSSLTOGET : <session_id>,<status>** **+KGNSS_ERROR : <session_id>,<status>**
Reference Sierra Wireless SA Proprietary	Notes The URC is displayed at the end of the download process The location of the file in File System in folder /gps/lto/ This command must be used after connection configuration by KGNSSLTOCFG This command is an option and it is subject to a commercial offer Example

AT+KGNSSLTOGET : Get CBEE file from server	HiALL NC only
	AT+KGNSSLTOCFG=0,"gllto.glpals.com","/7day/v2/latest/lto2.dat" +KGNSSLTOCFG: **1** AT+KGNSSLTOGET=**1** **OK** +KGNSSLTOGET : 1, 1 +KGNSSLTOGET : 1, 2 +KGNSSLTOGET : 1, 3 +KGNSSLTOGET : 1, 0 <--- the downloaded file is saved in /gps/lto/lto2.dat

17.12. +KGNSSLTOVT: Check Validity Time

Description

This command allows the module to check the validity time of the CBEE data.

Syntax

AT+KGNSSLTOVT : Check validity time of extended ephemeris data	HiALL NC only
Read command Syntax **AT+KGNSSLTOVT?**	Response **+KGNSSLTOVT: <val_time>** **OK** Parameters **<val_time>:** Validity time in hours. If 0 returned, extended ephemeris data need to be download again
Reference Sierra Wireless SA Proprietary	Notes • This command is an option and it is subject to a commercial offer

17.13. +KUARTCFG: UART Configuration

Description

This command aims to define the mode of the UART port.

Syntax

AT+ KUARTCFG : Select the UART use	HiALL NC only
Test command Syntax **AT+KUARTCFG=?**	Response **+KUARTCFG:** (list of supported **<Mode>**s) **OK**

<table>
<tr><th colspan="2">AT+ KUARTCFG : Select the UART use HiALL NC only</th></tr>
<tr><td>Read command

Syntax
AT+KUARTCFG?</td><td>

Response
+KUARTCFG: <Mode>
OK</td></tr>
<tr><td>Write command

Syntax
AT+KUARTCFG=<Mode></td><td>

Response
OK

Parameters
<Mode>:

<table>
<tr><td colspan="2">Port</td><td>UART0</td><td>UART1</td><td>SPI</td></tr>
<tr><td>Function</td><td><Mode>=0</td><td>NMEA</td><td>AT/DATA</td><td>Traces</td></tr>
<tr><td></td><td><Mode>=1</td><td></td><td>AT/DATA/NMEA</td><td>Traces</td></tr>
<tr><td></td><td><Mode>=100</td><td>Traces</td><td>AT/DATA/NMEA</td><td></td></tr>
</table>
</td></tr>
<tr><td>Reference
Sierra Wireless SA Proprietary</td><td>Notes
• The mode set by KUARTCFG is taken into account at the next KNMEARCV command
• Default <Mode> is 0
• UART0 is fixed with 115200 baud rate, 8 N1
• To use <Mode> 100, after “AT+KUARTCFG=0”, needs to REBOOT the module (send “AT+CFUN=1,1”, do NOT power off the module)</td></tr>
</table>

<table>
<tr><th colspan="2">AT+KUARTCFG : Configure UART function and USB CDC HiLoNC3GPS only</th></tr>
<tr><td>Test command

Syntax
AT+KUARTCFG =?</td><td>

Response
+KUARTCFG:(list of supported <n>)
OK</td></tr>
<tr><td>Read command

Syntax
AT+KUARTCFG?</td><td>

Response
+KUARTCFG:<n>
OK</td></tr>
</table>

<table>
<tr><th colspan="2">AT+KUARTCFG : Configure UART function and USB CDC — HiLoNC3GPS only</th></tr>
<tr><td>Write command

Syntax
AT+KUARTCFG =<n></td><td>Response
OK

Parameters
<n>:
<table>
<tr><td colspan="2">Port</td><td>UART</td><td>USB CDC1</td><td>USB CDC2</td><td>USB CDC3</td></tr>
<tr><td>Function</td><td><n>=0</td><td>AT/DATA/ NMEA</td><td>AT/DATA</td><td>NMEA</td><td>Traces</td></tr>
<tr><td></td><td><n>=1</td><td>NMEA</td><td>AT/DATA</td><td>AT</td><td>Traces</td></tr>
<tr><td></td><td><n>=2</td><td>Traces</td><td>AT/DATA</td><td>NMEA</td><td>AT</td></tr>
</table></td></tr>
<tr><td>Reference
Sierra Wireless Proprietary</td><td>Notes
• This command is allowed only on USB port. It must answer ERROR on UART
• The configuration is saved in NV memory</td></tr>
</table>

17.14. +KGNSSVSN: GNSS Library Version

Description

KGNSSVSN command returns the GNSS library version used in the module (for HiAll NC product only).

Syntax

<table>
<tr><th colspan="2">AT+KGNSSVSN : returns the GNSS library version — HiALL NC HiLoNC3GPS only</th></tr>
<tr><td>Test command

Syntax
AT+KGNSSVSN=?</td><td>Response
OK</td></tr>
<tr><td>Read command

Syntax
AT+KGNSSVSN?</td><td>Response
+ KGNSSVSN: <GNSS library Version>
OK

<GNSS library Version>: string type</td></tr>
<tr><td>Write command

No write command</td><td>No write command</td></tr>
<tr><td>Reference
Sierra Wireless Proprietary</td><td>Notes</td></tr>
<tr><td>Example</td><td>1. GNSS library version used

AT+KGNSSVSN?
+ KGNSSVSN: ”2.18.11.115150”
OK</td></tr>
</table>

17.15. +KAGNSSACT: Activate Assisted Positioning

Description

KAGNSSACT command allows activating or deactivating the assisted positioning feature like A-GPS.

Syntax

AT+KAGNSSACT : Active or deactivate the assisted positioning	**HiLoNC3GPS only**
Test command Syntax **AT+KAGNSSACT=?**	 Response **+KAGNSSACT:** (list of supported **<state>**s) **OK**
Read command Syntax **AT+ KAGNSSACT?**	 Response **+KAGNSSACT: <state>** **OK**
Write command **AT+ KAGNSSACT = <state>**	 Response **OK** **<state>:** integer type 0: deactivated 1: activated
Reference Sierra Wireless Proprietary	Notes By default <state> is 0. The default value can be set by a non-volatile memory item
Example	Active assisted positioning AT+ KAGNSSACT =1 OK Get assisted positioning state AT+ KAGNSSACT? +KAGNSSACT: 1 OK Disable assisted positioning AT+ KAGNSSACT =0 OK Active assisted positioning AT+ KAGNSSACT =? +KAGNSSACT: (0,1) OK

17.16. Use cases

DTE must be configured in hardware flow control:

DTE sends:

AT&K3

Module answers:

OK

1. **Case KUARTMODE set to 0 (Hidden because to be reviewed)**
   a. **Use of KNMEARCV to trigger NMEA output (and Broadcom traces if requested)**

1/

Select mode for UART 0

MODE AT

2/

// Choice NMEA frames

// Choice GNSS level traces

AT+KGNSSDBG=1, 2 // NMEA Standards + Proprietary, Extended Trace Broadcom

OK

AT+KGNSSRUN=1

+KGNSSRUN: 1, 1000

OK

3/

Output NMEA frames on:

UART0 if MODE NMEA selected

else UART1 // so mode TRACE or mode AT (not yet implemented)

// NMEA frames output triggered by KNMEARCV :

AT+KNMEARCV=1

CONNECT

41,V,,,,,,,121011,,,N*72

$GPGGA,123902.41,,,,,0,00,300.0,,M,,M,,*6B

$PGLOR,1,STA,123902.41,0.000,0.000,0,2000,3000,0,P,F,L,1,C,0,S,0000,0,1*76

$PGLOR,1,SAT,R07,035,13,R08,041,13,R22,038,13,G21,040,3*15

etc....

b. Use of KGNSSRST to trigger NMEA output (and Broadcom traces if requested)

1/

Select mode for UART 0

MODE NMEA

MODE AT

MODE TRACE

2/

// Choice NMEA frames

// Choice GNSS level traces

AT+KGNSSDBG=1,2 // NMEA Standards + Proprietary , Extended Trace Broadcom

OK

// UART0 = MODE NMEA : output NMEA frames on UART0

3/

// Cde Restart

// NMEA frames output triggered by KGNSSRST:

AT+KGNSSRST=2,5 // restart type, number of repeat

OK // answer to KGNSSRST command on **UART1**

On **UART0 :**

41,V,,,,,,,121011,,,N*72

$GPGGA,123902.41,,,,,0,00,300.0,,M,,M,,*6B

$PGLOR,1,STA,123902.41,0.000,0.000,0,2000,3000,0,P,F,L,1,C,0,S,0000,0,1*76

$PGLOR,1,SAT,R07,035,13,R08,041,13,R22,038,13,G21,040,3*15

etc. ....

// UART0 = MODE TRACE: output traces on UART 0

OK

_SC: Hot_Starts

Custom Request Manager registration complete

---TASK---<Hot_Starts-_>---TASK---|5 of 1|

Etc. ....

// UART0 = MODE AT: no trace

// Usual Spy Tracer traces are output through SPI port

17.16.1. AT+KGNSSFACT: Factory Test

1. Description

Note: For R&D use only. See in Broadcom user manual (Factory test chapter)

Factory test is the special mode of the GLL used during production HW tests.

To conduct the factory test the GNSS signal simulator must be configured to generate the signal for one GNSS satellite with the zero offset relative to GNSS L1 frequency. The factory test is capable to detect:

6 Higher noise figure caused by misplaced parts, wrong values, etc.

7 Excess frequency error of a TCXO part

8 Sensitivity loss of 1.5 dB or more due to excessive phase noise of a bad TCXO

9 PRN : The GPS Satellite PRN configured in the simulator (255 disables it)

10

11 FCN: FCN number of the corresponding GLONASS Satellite frequency configured in the simulator (-8 disables it)

2. Syntax

AT+KGNSSFACT : Force GNSS factory test	
Test command Syntax **AT+ KGNSSFACT=?**	 Response **+ KGNSSFACT:** (list of supported **<prn>**, (list of supported **<fcn>**, (list of supported **<srn>**, list of supported **<test_item**, list of supported **< test_mode>**, range of **<Interval >**, range of **<duration>** **OK**
Read command Syntax **AT+ KGNSSFACT?**	 Response **+ KGNSSFACT: <prn>,<fcn>, <srn>, <test_item>, < test_mode>, < Interval >, <duration>** **OK**
Write command Syntax **AT+KGNSSFACT=** **[<prn> , <fcn>** **<snr> ,<test_item>[,<test_mode> [,<Interval>] [,<duration>]]]**	 Response **OK** Parameters **<prn>:** 0 to 32 **<fcn>:** 0 for GPS 0 to 14 for Glonass (see Notes) **<snr >:** 0 : Low SNR 1 : High SNR **<test_item>** 0 : GL_FACT_TEST_CW - Measure C/No using CW tone as RF input 1 : GL_FACT_TEST_CN0 - Measure C/No using GNSS signal as RF input 2 : GL_FACT_TEST_FRQ - Measure clock frequency error and C/No 3 : GL_FACT_TEST_WER - Measure word error rate and frequency

AT+KGNSSFACT : Force GNSS factory test	
	and C/No 4 : GL_FACT_TEST_ACQ - Measure acquisition time & C/No **<test_mode>** 0 : GL_FACT_TEST_ONCE - Stop test once the desired item tested 1 : GL_FACT_TEST_CONT - Once the signal locked keep tracking it **<Interval>** 1 to 99 (s) – default is 10 : **<duration>** 1 to 9999 (s) – default is 120 for low SNR or 60 to High SNR 9999 equal -1 (infinite)
Reference Sierra Wireless SA Proprietary	Do not use any other GNSS AT command as long as the current job is not finished (check <duration>) otherwise, you may receive an ERROR message Note 1: Test Factory High SNR is possible only if module is locked to the network. Note 2: PRN=0 - The GNSS Satellite PRN configured in the simulator (255 disables it) Duration : Maximum duration of the test Interval : Time interval over switch SNR will be averaged

AT+KGNSSFACT : Force GNSS factory test

Reference
Sierra Wireless SA Proprietary

FCN	Frequency(MHz)
0	disable
1	1598.0625
2	1598.625
3	1599.1875
4	1599.75
5	1600.3125
6	1600.875
7	1601.4375
8	1602.0
9	1602.5625
10	1603.125
11	1603.6875
12	1604.25
13	1604.8125
14	1605.375

A translation is done in glconfig script

FCN	Frequency(MHz)
-8	Disable
-7	1598.0625
-6	1598.625
-5	1599.1875
-4	1599.75
-3	1600.3125
-2	1600.875
-1	1601.4375
0	1602.0
1	1602.5625
2	1603.125
3	1603.6875
4	1604.25
5	1604.8125
6	1605.375

Example

```
AT+KGNSSFACT=?

+KGNSSFACT: (0-32),(0-14),(0-1),(0-4),(0-1),(10-60),(10-300)

OK

AT+KUARTCFG=0

OK

AT+KGNSSFACT = 5,0,1,0,0,10,20

OK
=======> Frames NMEA are sent on UART 0
OK
```

AT+KGNSSFACT : Force GNSS factory test	
Reference Sierra Wireless SA Proprietary	5,0,1,0,0,10,20 Done AT+KUARTCFG=1 OK AT+KGNSSFACT = 5,0,1,0,0,10,20 =======> Frames NMEA are sent on UART 1 CONNECT $PGLOR,0,NEW,FRQSCAN,0,FI,0,FE,0,STEP,0,US,0,BAND,1,MODE,0*53 $PGLOR,0,RID,BCD,2,18,11,115150*7A $GPGGA,235959.00,,,,,0,00,999.9,,M,,M,,*67 $PGLOR,2,FTS,5,,,dBm,,,,,dBHz,,,,,,,,,165.0,0,165,G*1A $PGLOR,1,STA,235959.00,0.000,0.000,0,2000,9999,0,P,F,L,1,C,0,S,0000,0,0*7B $PGLOR,1,SAT*31 $PGLOR,1,SIO,TxERR,0,RxERR,0,TxCNT,0,RxCNT,0,DTMS,702,DTIN,73,73,DTOUT,213,610,HATMD,0*33 $PGLOR,0,HLA,235959.00,L,,Al,,A,,H,,,M,,Ac,,Gr,,S,,,Sx,,,T,,Tr,,Mn,*07 $PGLOR,0,PPS,310307,235959.000,,,,,*10 $GPGSA,A,1,,,,,,,,,,,,,140.0,99.0,99.0*35 $GNGSA,A,1,,,,,,,,,,,,,140.0,99.0,99.0*2B $GNGSA,A,1,,,,,,,,,,,,,140.0,99.0,99.0*2B $QZGSA,A,1,,,,,,,,,,,,,140.0,99.0,99.0*29 $GPRMC,235959.00,V,,,,,,,310307,,,N*7A $PGLOR,0,FIX,0.6*25 $GPGGA,000000.00,,,,,0,00,999.9,,M,,M,,*66 $PGLOR,2,FTS,CW,,dBm,,,ppb,G*63 $PGLOR,1,STA,000000.00,0.000,0.000,0,2000,9999,0,P,F,L,1,C,0,S,0000,0,0*7A $PGLOR,1,SAT*31 $PGLOR,1,SIO,TxERR,0,RxERR,0,TxCNT,3812,RxCNT,1768,DTMS,904,DTIN,19,28,DTOUT,304,1108,HATMD,-100*2D $PGLOR,0,HLA,000000.00,L,,Al,,A,,H,,,M,,Ac,,Gr,,S,,,Sx,,,T,,Tr,,Mn,*06 $PGLOR,0,PPS,010407,000000.004,,,,,*11 $GPGSA,A,1,,,,,,,,,,,,,140.0,99.0,99.0*35 $GNGSA,A,1,,,,,,,,,,,,,140.0,99.0,99.0*2B $GNGSA,A,1,,,,,,,,,,,,,140.0,99.0,99.0*2B $QZGSA,A,1,,,,,,,,,,,,,140.0,99.0,99.0*29 $GPRMC,000000.00,V,,,,,,,010407,,,N*7F $PGLOR,0,FIX,1.6*24 $PGLOR,2,FIN,0,0,,*35 OK 5,0,1,0,0,10,20 Done

17.16.2. AT+KGNSSDBG: Debug

1. Description

Note: For R&D use only.

2. Syntax

AT+KGNSSDBG : Debug for GNSS feature	
Test command Syntax **AT+KGNSSDBG=?**	 Response **+KGNSSDBG:** (list of supported **< NMEA_Proprietary_Frames >**s), (list of supported < Traces >s) , (list of supported **< I2C_speed >**s) **OK**
Read command Syntax **AT+KGNSSDBG?**	 Response **+KGNSSDBG: < NMEA_Proprietary_Frames >,< Traces >,< I2C_speed >** **OK**
Write command Syntax **AT+KGNSSDBG=[<NMEA_Proprietary_Frames>[,<Traces>[,<I2C_speed>]]]**	 Response **OK** Parameters **< NMEA_Proprietary_Frames >: (not standard NMEA frames)** 0 deactivated: Proprietary NMEA frames are not sent to TE by AT+KNMEARCV 1 Activated: Proprietary NMEA frames are sent to TE by AT+KNMEARCV **< Traces >:** 0 Traces Sierra Wireless + Broadcom • Traces Broadcom only • Extended traces Broadcom • Traces Sierra Wireless only **< I2C_speed >:** 1 100kHz 4 400kHz
Reference Sierra Wireless SA Proprietary	Notes Traces are sent to SPI **Example :** AT+KGNSSDBG=1,3 OK AT+KGNSSDBG? +KGNSSDBG: 1, 3, 4 OK

18. Appendix

18.1. Appendix 1: Result Codes and Unsolicited Messages

Verbose result code	Numeric	Type	Description
+CCCM: <ccm>	like verbose	Unsolicited	
+CCWA: <number>,<type>,<class>[,<alpha>]	like verbose	Unsolicited	
+CLIP: <number>,<type>[,<subaddr>,<satype>[,<alpha>]]	like verbose	Unsolicited	
+CME ERROR: <err>	like verbose	Final	
+CMS ERROR: <err>	like verbose	Final or unsolicited	
+CMTI	like verbose	Unsolicited	
+CBM	like verbose	Unsolicited	
+CDS	like verbose	Unsolicited	
+COLP: <number>,<type>[,<subaddr> ,<satype>[,<alpha>]]	like verbose	Intermediate	
+CR: <type>	like verbose	Intermediate	
+CREG: <stat>[,<lac>,<ci>]	like verbose	Unsolicited	
+CRING: <type>	like verbose	Unsolicited	
+CSSI: <code1>[,<index>]	like verbose	Intermediate	
+CSSU: <code2>[,<index>[,<number>,<type>[,<subaddr>,<satype>]]]	like verbose	Unsolicited	
+CUSD: <m>[,<str>,<dcs>]	like verbose	Unsolicited	
BUSY	6	Final	
CONNECT	1	Intermediate	connection has been established
CONNECT <text>	manufacturer specific	Intermediate	like CONNECT but manufacturer specific <text> gives additional information (e.g. connection data rate)
ERROR	4	Final	command not accepted
NO ANSWER	7	Final	connection completion timeout
NO CARRIER	3	Final	connection terminated
NO DIALTONE	5	Final	no dial tone detected
OK	0	Final	acknowledges execution of a command line
RING	2	Unsolicited	incoming call signal from network

18.2. Appendix 2: Error Codes

18.2.1. CME Error codes

Code of <err>	Meaning
0	Phone failure
1	No connection to phone
2	Phone-adapter link reserved
3	Operation not allowed
4	Operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	Memory full
21	Invalid index
22	Not found
23	Memory failure
24	Text string too long
25	Invalid characters in text string
26	Dial string too long
27	Invalid characters in dial string

Code of <err>	Meaning
30	No network service
31	Network timeout
32	network not allowed - emergency call only
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
99	Resource limitation
100	Synchronization error
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
132	service option not supported
133	requested service option not subscribed
134	service option temporarily out of order
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class

18.2.2. CMS Error codes

Code number in <err>	Meaning
1	Unassigned (unallocated) number
8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable, unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message, unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message not compatible with short message protocol state
99	Information element non-existent or not implemented
111	Protocol error, unspecified
127	Interworking, unspecified
128	Telematic interworking not supported
129	Short message Type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme (alphabet) not supported

Code number in <err>	Meaning
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be executed
161	Command unsupported
175	Unspecified TP-Command error
176	TPDU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
198	TP-VPF not supported
199	TP-VP not supported
208	D0 SIM SMS storage full
209	No SMS storage capability in SIM
210	Error in MS
211	Memory Capacity Exceeded
212	SIM Application Toolkit Busy
213	SIM data download error
255	Unspecified error cause
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN required

Code number in <err>	Meaning
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	no network service
332	Network timeout
340	NO +CNMA ACK EXPECTED
500	Unknown error

18.2.3. GPRS Error codes

Code number in <err>	Meaning
Errors related to a failure to perform an Attach	
103	Illegal MS (#3)
106	Illegal ME (#6)
107	GPRS services not allowed (#7)
111	PLMN not allowed (#11)
112	Location area not allowed (#12)
113	Roaming not allowed in this location area (#13)
Errors related to a failure to activate a Context	
132	service option not supported (#32)
133	requested service option not subscribed (#33)
134	service option temporarily out of order (#34)
Other GPRS Errors	
149	PDP authentication failure
148	unspecified GPRS error
150	invalid mobile class

Values in parentheses are TS 24.008 cause codes.

Other values in the range 101 - 150 are reserved for use by GPRS.

18.2.4. FTP Reply codes

FTP Reply Code	Meaning
110	Restart marker reply.
120	Service ready in nnn minutes.
125	Data connection already open: transfer starting.
150	File status okay; about to open data connection.
200	Command okay.
202	Command not implemented, superfluous at this site.
211	System status, or system help reply.
212	Directory status.
213	File status.
214	Help message.
215	NAME system type.
220	Service ready for new user.
221	Service closing control connection. Logged out if appropriate. Unassigned (unallocated) number
225	Data connection open; no transfer in progress.
226	Closing data connection. Requested file action successful (for example, file transfer or file abort).
227	Entering Passive Mode (h1,h2,h3,h4,p1,p2).
22	User logged in, proceed.
250	Requested file action okay, completed.
257	"PATHNAME" created.
331	User name okay, need password.
332	Need account for login.
350	Requested file action pending further information.
421	Service not available, closing control connection. This may be a reply to any command if the service knows it must shut down.
425	Can't open data connection.
426	Connection closed; transfer aborted.
450	Requested file action not taken. File unavailable (e.g., file busy).
451	Requested action aborted: local error in processing.

FTP Reply Code	Meaning
452	Requested action not taken. Insufficient storage space in system.
500	Syntax error, command unrecognized. This may include errors such as command line too long.
501	Syntax error in parameters or arguments.
502	Command not implemented
503	Bad sequence of commands.
504	Command not implemented for that parameter.
530	Not logged in.
532	Need account for storing files.
550	Requested action not taken. File unavailable (e.g., file not found, no access).
551	Requested action aborted: page type unknown.
552	Requested file action aborted. Exceeded storage allocation (for current directory or dataset).
553	Requested action not taken. File name not allowed.

18.3. Appendix 3: Commands without Pin Code Requirement

Most AT Commands are rejected (i.e. an error is returned to the DTE) if the valid PIN Code has not been entered (SIM requirement as described in [SIM]).

The main commands which can be sent without the PIN code include:

- ATD (emergency calls)
- AT+CPIN
- ATI
- AT+CGMI, AT+GMI
- AT+CGMM, AT+GMM
- AT+CGMR, AT+GMR
- AT+CGSN, AT+GSN
- AT+GCAP
- AT+CPAS
- AT+CIND
- AT+CMEE
- AT+KSREP
- AT+IPR
- ATE, ATV, ATS, ATZ
- AT&F, AT&K, AT&D, AT&C
- AT+CBST,
- AT+CLVL
- …

This list may be modified in case of special needs from the customer (contact Sierra Wireless directly to treat this kind of request)

Note: Some commands require the PIN2 code. PIN 2 information is available in the [SIM] document.

18.4. Appendix 4: GSM 27.010 Multiplexing protocol

Main options	BASIC	YES
	ADVANCED	YES
	advanced WITH ERROR RECOVERY	NO
Frames	SABM	YES
	UA	YES
	DM	YES
	DISC	YES
	I (ERM)	NO
	RR (ERM)	NO
	RNR (ERM)	NO
	REJ (ERM)	NO
	UI	YES
	UIH	YES
Multiplexer Controls	DLC parameters negotiation (PN) (optional)	YES
	Power Saving control (PSC)	YES
	Multiplexer Close Down (CLD)	YES
	Test Command (Test)	YES
	Flow control On Command (Fcon)	YES
	Flow control Off Command (Fcoff)	YES
	Modem Status Command (MSC)	YES
	Non Supported Command response (NSC)	YES
	Remote Port Negotiation (RPN). (optional)	NO
	Remote Line Status command (RLS).(optional)	YES
	Service Negotiation Command (SNC)	NO
Convergence Layers	Type 1 - Unstructured Octet Stream	YES
	Type 2 - Unstructured Octet Stream with flow control, break signal handling and transmission of v24 signal states	YES
	Type 3 – Uninterruptible Framed Data	NO
	Type 4 - Interruptible Framed Data	NO
CMUX parameters	Link speed	9600, 19200, 38400, 57600, 115200
	Maximum frame size	1540
	Acknowledgment timer	100
	Maximum number of retransmissions	100
	Response timer for control channel	30
	Wake up response timer	10 seconds
Others	Wake up procedure (see [RE2] sub clause 5.4.7)	YES
	Priority management	YES
	DLCI number limitation	8

18.5. Appendix 5: Supported commands for HiLo modules

The following table lists all the commands available in the HiLo module

Legend: Column A:

- ● Command is supported in HiLo V1 and HiLo V2 / HiAll NC
- ⊙ Command is only supported in HiLo V1
- ○ Command is only supported in HiLo V2 / HiAll NC

Legend: Column B:

- ● Command can be supported even without SIM card
- ⊙ Command cannot be supported without SIM card

The Colors are used to indicate the **recommended** Timeout for AT commands, time changes according SIM Cards and Networks:

	2 seconds
	5 seconds
	30 seconds
	60 seconds
	120 seconds
	no advised timeout : Data size dependent

	HiLo	A	B	HiLo 3G	HiLo NC 3GPS
2.	**V25TER AT COMMANDS**				
2.1.	A/ Command: Repeat previous command line	●	●	X	X
2.2.	+++ Command: Switch from data mode to command mode	●	⊙	X	X
2.3.	O Command: Switch from command mode to data mode	●	⊙	X	X
2.4.	E Command: Enable command echo	●	●	X	X
2.5.	Q Command: Set result code presentation mode	●	●	X	X
2.6.	S0 Command: Set number of rings before automatically answering the call	●	●	X	X
2.7.	S2 Command: Set character for the escape sequence (data to command mode)	●	●	X	X
2.8.	S3 Command: Command line termination character	●	●	X	X
2.9.	S4 Command: Set response formatting character	●	●	X	X
2.10.	S5 Command: Write command line editing character	●	●	X	X
2.11.	S7 Command: Set number of seconds to wait for connection completion	●	●	X	X
2.12.	V Command: TA response format	●	●	X	X
2.13.	X Command: Result code selection and call progress monitoring control	●	●	X	X

	HiLo	A	B	HiLo 3G	HiLo NC 3GPS
2.14.	&C Command: Set circuit Data Carrier Detect (DCD) function mode	●	●	X	X
2.15.	&D Command: Set circuit Data Terminal Ready (DTR) function mode	●	●	X	X
2.16.	&F Command: Restore manufactory configuration	●	●	X	X
2.17.	&W Command: Save stored profile	●	●	X	X
2.18.	&V Command: Display current configuration	●	●	X	X
2.19.	+IPR Command : Set fixed local rate	●	●	x	x
2.20.	B: Data rate selection	●	●	X	X
2.21.	\N: Data transmission mode	●	●	X	X
2.22.	&K Command: Flow control option	●	●	X	X
2.23.	L Command: Monitor speaker loudness	●	●	X	X
2.24.	M Command: Monitor speaker mode	●	●	X	X
2.25.	S6 Command: Pause before blind dialing	●	●	X	X
2.26.	S8 Command: Comma dial modifier time	●	●	X	X
2.27.	S10 Command: Automatic disconnect delay	●	●	X	X
2.28.	N Command: Negotiate handshake option	●	●	X	X
2.29.	S1 Command: Ring count	●	●	X	X
2.30.	S11 Command: DTMF Dialing speed	●	●	x	x
2.31.	W Command: Extended result code	●	●	X	X
2.32.	&S Command: DSR option	●	●	x	x
2.33.	&R Command: RTS/CTS option	●	●	X	X
2.34.	&E Command: data rate option for data call			x	x
3.	**GENERAL AT COMMANDS**				
3.1.	I Command: Request Identification Information	●	●	X	X
3.2.	Z Command: Reset and restore user configuration	●	●	X	X
3.3.	+CGMI Command: Request manufacturer identification	●	●	X	X
3.4.	+CGMM Command: Request model identification	●	●	X	X
3.5.	+CGMR Command: Request revision identification	●	●	X	X
3.6.	+CGSN Command: Request product serial number identification (IMEI)	●	●	X	X
3.7.	+KGSN Command: Request product serial number identification and Software Version	●	●	X	X
3.8.	+CSCS Command: Set TE character set	●	⊙	X	X
3.9.	+CIMI Command: Request international subscriber identity	●	⊙	X	X
3.10.	+GCAP Command: Request complete TA capability list	●	⊙	X	X
3.11.	+GMI Command: Request manufacturer identification	●	●	X	X
3.12.	+GMM Command: Request model identification	●	●	X	X
3.13.	+GMR Command: Request revision identification	●	●	X	X
3.14.	+GSN Command: Request product serial number identification (IMEI) identical to GSN	●	●	X	X
3.15.	+CMUX Command: Multiplexing mode	●	●		x
3.16.	#CLS Command: Service Class	●	⊙	x	x
3.17.	*PSLOCUP Command: Generates a location update of MS	●	⊙		

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3.18.	*PSCSCN Command: Call State Change Notification	●	●		
3.19.	*PSFSNT Command: Field Strength Notification with Threshold	●	⊙		
3.20.	*PSSSURC Command: Enable additional result code	●	●		
3.21.	*PSALS Command: Alternate Line Service	●	⊙		
3.22.	*PSDCIN Command: Diverted Call Indicator Notification	●	⊙		
3.23.	* PSMBNB Command: Mailbox Numbers	●	⊙		
3.24.	*PSCSP Command: Customer Service Profile	●	⊙		
3.25.	*PSSEAV Command: Service Availability	●	●		
3.26.	*PSCHRU Command: Channel Registration URC	●	⊙		
3.27.	*PSCSSC Command: Call Successful setup control	●	●		
3.28.	*PSSMPH Command: SIM Phase	○	⊙		
3.29.	*PSCIPH Command: Ciphering notification	○	⊙		
3.30	+KBLVER Command : Request the boot loader version			x	x
4.	**CALL CONTROL COMMANDS**				
4.1.	A Command: Answer a call	●	⊙	X	X
4.2.	H Command: Disconnect existing connection	●	●	X	X
4.3.	D Command: Mobile originated call to dial a number	●	●	X	X
4.4.	D>: Direct dialing from phonebook	●	⊙	X	X
4.5.	+CHUP Command: Hang up call	●	⊙	X	X
4.6.	+CRC Command: Set Cellular Result Codes for incoming call indication	●	●	X	X
4.7.	+CSTA Command: Select type of address	●	⊙	X	X
4.8.	+CMOD Command: Call mode	●	●	X	X
4.9.	+CEER Command: Extended error report	●	●	X	X
4.10.	+CVHU Command: Voice hang up control	●	⊙	X	X
4.11.	+KFILTER Command: Make a filter on incoming call	●	⊙	X	X
4.12.	+CSNS Command: Single Numbering Scheme	●	⊙	X	X
4.13.	+KATH Command: Choose ATH Mode	●	⊙		
5.	**MOBILE EQUIPMENT CONTROL AND STATUS COMMANDS**				
5.1.	+CACM Command: Accumulated call meter (ACM) reset or query	●	⊙	X	
5.2.	+CAMM Command: Accumulated call meter maximum (ACM max) set or query	●	⊙	X	
5.3.	+CCWE Command: Call Meter maximum event	●	⊙	X	
5.4.	+CALA Command: Set alarm time	●	●	X	
5.5.	+CALD Command: Delete alarm	●	●	X	
5.6.	+CCLK Command: Real time clock	●	●	X	
5.7.	*PSCPOF Command: Power off	●	●		
5.8.	+CPOF Command: Power off			x	x
5.9.	+CIND Command: Indicator control	●	●	X	X
5.10.	+CLAC Command: List all available AT commands	●	⊙	X	X
5.11.	+CMEC Command: Mobile Equipment control mode	●	●	X	X

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5.12.	+CFUN Command: Set Phone Functionality	●	●	X	X
5.13.	+CMER Command: Mobile Equipment event reporting	●	●	X	X
5.14.	+CMEE Command: Report Mobile Termination error	●	●	X	X
5.15.	+CMUT Command: Mute control	●	⊙	X	X
5.16.	+CPIN Command: Enter pin	●	⊙	X	X
5.17.	*PSPRAS Command: Pin Remaining Attempt Status	●	⊙		
5.18.	+CPUC Command: Price per unit and currency table	●	⊙	X	X
5.19.	+CPWC Command: Power class	●	⊙	X	X
5.20.	*PSRDBS Command: Change Frequency Band class	●	●		
5.21.	+CPAS Command: Phone Activity Status	●	●	x	x
5.22.	+CSQ Command: Signal quality	●	●	X	X
5.23.	+KRIC Command: Ring indicator control	●	●	X	X
5.24.	+KSREP Command: Mobile start-up reporting	●	●	X	X
5.25.	+KGPIO Command: Hardware IO Control	●	●	X	X
5.26.	+KSLEEP Command: Power Management Control	●	●	X	X
5.27.	+KCELL Command: Cell Environment Information	●	●	X	X
5.28.	+CRMP Command: Ring Melody Playback	●	●	X	X
5.29.	*PSVMWN Command: Voice Message Waiting Notification	●	●	X	X
5.30.	+CRSM Command: SIM Restricted Access	●	⊙	X	X
5.31.	+KPWM Command: PWM control	●	●		
5.32.	+KGPIOCFG Command: user GPIO configuration	●	●	x	x
5.33.	+KADC Command: analog digital converter	●	●		
5.34.	+CSIM Command: Generic SIM access	●	⊙	X	X
5.35.	+CALM Command: Alert sound mode	●	⊙	X	X
5.36.	+CRSL Command: Ringer sound level	●	●	X	X
5.37.	+CLAN Command: Set Language	●	⊙	X	X
5.38.	+CSGT Command: Set Greeting Text	●	⊙	X	X
5.39.	+CSVM Command: Set Voice Mail Number	●	⊙	X	X
5.40.	+KGSMAD Command: Antenna Detection	●	●		
5.41.	+KMCLASS Command: Change GPRS Multislot class	●	⊙	X	X
5.42.	+KTEMPMON Command: Temperature Monitor	●	●	X	X
5.43.	+KSIMDET Command: SIM Detection	●	●	X	X
5.44.	+KSYNC Command: Generation of Application synchronization signal	●	●	X	X
5.45.	+KBND Command: Current GSM Networks Band Indicator	●	●	x	x
5.46.	+KNETSCAN Command: Network scan functionality	●	●	x	x
5.47.	+KCELLSCAN Command: Cell scan functionality	●	●	x	x
5.48.	+KJAMDET Command: Jamming Detection	●	⊙		
5.49.	+KUART Command: Set number of bits for UART	●	●		
5.50.	+KSAP Command: Remote Sim Access functionality	●	●		
5.51.	+KPLAYSOUND Command: Play Audio File	●	●		
5.52.	+KEFA Command: Deployment package signature verification and	●	●		

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	firmware upgrading				
5.53.	+KBCAP Command: Retrieve Bitmap Capabilities	●	●	x	x
5.54.	+KRST Command: Module reset periodically	○	●		
5.55.	+KPLAYAMR Command: Play AMR File	○	●		x
5.56	+KSIMSEL Command: SIM selection				
5.57	+KSRAT Command: Set Radio Access Technology		⊙	x	x
5.58	+KLVSH Command: Extra power consumption		⊙	x	
5.59	+CTZU Command: Automatic Time Zone Update	○	●		
5.60	+CTZR Command: Time Zone Reporting	○	●		
5.62	+KGSMBOOT Command: GSM Stack Boot Mode	○	●		
6.	**NETWORK SERVICE RELATED COMMANDS**				
6.1.	+CAOC Command: Advice of charge information	●	⊙	X	X
6.2.	+CCFC Command: Call forwarding number and conditions control	●	⊙	X	X
6.3.	+CCWA Command: Call waiting	●	⊙	X	X
6.4.	+CHLD Command: Call hold and multiparty	●	⊙	X	X
6.5.	+CUSD: Unstructured Supplementary Service Data	●	⊙	X	X
6.6.	+CLCC Command: List current call	●	⊙	X	X
6.7.	+CLCK Command: Facility lock	●	⊙	X	X
6.8.	+CLIP Command: Calling line identification presentation	●	⊙	X	X
6.9.	+CLIR Command: Calling line identification restriction	●	⊙	X	X
6.10.	+CNUM Command: Subscriber number	●	⊙	X	X
6.11.	+COLP Command: Connected line identification presentation	●	⊙	X	X
6.12.	+COPN Command: Read operator name	●	⊙	X	X
6.13.	+COPS Command: Operator selection	●	●	X	X
6.14.	+CPOL Command: Preferred PLMN list	●	⊙	X	X
6.15.	+CPWD Command: Change password	●	⊙	X	X
6.16.	+CREG Command: Network registration	●	●	X	X
6.17.	+CSSN Command: Supplementary service notification	●	●	X	X
6.18.	+CPLS Command: Selection of preferred PLMN list	●	⊙	X	X
6.19.	+CTFR Command: Call deflection	●	⊙	X	X
6.20.	*PSOPNM Command: Operator name	○	⊙		
6.21.	*PSNTRG Command: Network registration	○	⊙		
6.22.	*PSHZNT Command: Home zone notification	○	⊙		
6.23.	*PSUTTZ Command: Universal time and time zone	○	⊙		
6.24.	*PSHPLMN Command: Home PLMN	○	⊙		
6.25.	*PSGAAT Command: GPRS automatic attach	○	⊙		
6.26.	*PSNWID Command: Network identity	○	⊙		
7.	**PHONE BOOK MANAGEMENT**				
7.1.	+CPBF Command: Find phonebook entries	●	⊙	x	X
7.2.	+CPBR Command: Read current phonebook entries	●	⊙	X	x

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7.3.	+CPBS Command: Select phonebook memory storage	●	⊙	x	X
7.4.	+CPBW Command: Write phonebook entries	●	⊙	X	x
8.	**SMS AT COMMANDS**				
8.3.	+CMGD Command: Delete SMS message	●	⊙	X	X
8.4.	+CMGF Command: Select SMS message format	●	●	X	X
8.5.	+CMGL Command: List SMS messages from preferred storage	●	⊙	X	X
8.6.	+CMGR Command: Read SMS message	●	⊙	X	X
8.7.	+CMGS Command: Send SMS message	●	⊙	X	X
8.8.	+CMGW Command: Write SMS message to memory	●	⊙	X	X
8.9.	+CMSS Command: Send SMS message from storage	●	⊙	X	X
8.10.	+CNMI Command: New SMS message indication	●	⊙	X	X
8.11.	+CSCB Command: Select cell broadcast message	●	⊙	X	X
8.12.	+CSCA Command: SMS service center address	●	⊙	X	X
8.13.	+CSMP Command: Set SMS text mode parameters	●	⊙	X	X
8.14.	+CSMS Command: Select Message service	●	⊙	X	X
8.15.	+CPMS Command: Preferred Message Storage	●	⊙	X	X
8.16.	+CSDH Command: Show text mode parameters	●	⊙	X	X
8.17.	+CSAS Command: Save settings	●	⊙	X	X
8.18.	+CRES Command: Restore settings	●	⊙	X	X
8.19.	+CMT Notification: Received SMSPP content	●	⊙	x	x
8.20.	*PSMEMCAP Command: SMS Memory capacity	○	⊙		
9.	**DATA AND FAX AT COMMANDS**				
9.1.	+CBST Command : Select bearer service type	●	●	X	X
9.2.	+CRLP Command : Select radio link protocol parameter	●	●	X	X
9.3.	+CR Command : Service reporting control	●	●	X	X
9.4.	+FCLASS Command : Fax : Select, read or test service class	●	●		
9.5.	+FRM Command : Receive data	⊙	⊙		
9.6.	+FTM Command : Transmit data	⊙	⊙		
9.7.	+FRS Command : Receive silence	⊙	⊙		
9.8.	+FTS Command : Stop transmission and wait	⊙	⊙		
9.9.	+FRH Command : Receive data using HDLC framing	⊙	⊙		
9.10.	+FTH Command : Transmit data using HDLC framing	⊙	⊙		
9.11.	+FMI Command : Manufacturer identification	●	●	X	X
9.12.	+FMM Command : Model identification	●	●	X	X
9.13.	+FMR Command : Revision identification	●	●	x	x
10.	**GPRS AT COMMANDS**				
10.1.	+CGATT Command : PS Attach or Detach	●	⊙	X	X
10.2.	+CGACT Command : PDP context activate or deactivate	●	⊙	X	X
10.3.	+CGCLASS Command : GPRS Mobile station class	●	⊙	X	X

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10.4.	+CGDCONT Command : Define PDP context	●	⊙	X	X
10.5.	+CGEREP Command : GPRS event reporting	●	⊙	X	X
10.6.	+CGPADDR Command : Show PDP address	●	⊙	X	X
10.7.	+CGQMIN Command : Quality of service profile (minimum acceptable)	●	⊙	X	X
10.8.	+CGQREQ Command : Request quality of service profile	●	⊙	X	X
10.9.	+CGREG Command : GPRS Network registration Status	●	●	X	X
10.10.	+CGSMS Command : Select service for MO SMS messages	●	⊙	X	X
10.11	*PSGCNT Command: GPRS counters	○	⊙		
10.12	+CGEQMIN Command: 3G Quality of Service Profile			x	X
10.13	+CGEQREQ Command: 3G Quality of Service Profile			X	x
10.14	+CGEQNEG Command: 3G Quality of Service Profile			x	X
11.	**SIM APPLICATION TOOLKIT AT COMMANDS**				
11.2.	*PSSTKI Command : SIM ToolKit Interface configuration	●	⊙	X	X
11.3.	*PSSTK Command : SIM Toolkit command	●	⊙	x	X
12.	**AUDIO COMMANDS**				
12.2.	+CLVL Command: Loudspeaker volume level	●	●	X	X
12.3.	+VIP Command: Initialize Voice Parameters	●	⊙	X	X
12.4.	+VTS Command: DTMF and Tone generation	●	⊙	X	X
12.5.	+VTD Command: Tone duration	●	●	X	X
12.6.	+VGR Command: Receive Gain Selection	●	⊙	X	X
12.7.	+VGT Command: Transmit Gain Selection	●	⊙	X	X
12.8.	+KVGR Command: Receive Gain Selection	●	⊙	X	X
12.9.	+KVGT Command: Transmit Gain Selection	●	⊙	X	X
12.10.	+KECHO Command: Echo Cancellation	●	⊙	X	X
12.11.	+KNOISE Command: Noise Cancellation	●	⊙	X	X
12.12.	+KST Command: Side Tone	●	⊙	X	X
12.13.	+KPC Command: Peak Compressor	●	⊙	X	X
12.14.	+KSRAP Command: Save Restore Audio Parameters	●	⊙	x	x
12.15.	+KDSPTX Command: Read TX Audio Parameters	●	⊙		
12.16.	+KDSPRX Command: Read RX Audio Parameters	●	⊙		
12.17	+KPCMTXVOL Command: Tx Volume of PCM Interface			x	X
12.18	+KPCMRXVOL Command: Rx Volume of PCM Interface			x	x
12.19	+KPCMCFG Command: Configure PCM digital audio	○	●		x
13.	**PROTOCOL SPECIFIC COMMANDS**				
13.2.1.	+KCNXCFG : GPRS Connection Configuration	●	⊙	x	X
13.2.2.	+KCNXTIMER : Connection Timer Configuration	●	⊙	X	x
13.2.3.	+KCNXPROFILE : Connection current profile configuration	●	⊙		
13.2.4.	+KCGPADDR: Show PDP address	●	⊙		
13.2.5	+CGPADDR Command: Show PDP address			x	x

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13.3.	**End Of Data pattern**				
13.3.1.	+KPATTERN: Custom End Of Data pattern	●	⊙	x	x
13.4.	**TCP Specific Commands**				
13.4.1.	+KTCPCFG: TCP Connection Configuration	●	⊙	x	x
13.4.2.	+KTCPCNX: TCP Connection	●	⊙	X	X
13.4.3.	+KTCPRCV: Receiving data through a TCP Connection	●	⊙	X	X
13.4.4.	+KTCPSND: Sending data through a TCP Connection	●	⊙	X	X
13.4.5.	+KTCPCLOSE: Closing current TCP operation	●	⊙	X	X
13.4.6.	+KTCPDEL: Delete a configured TCP session	●	⊙	X	X
13.4.7.	+KTCP_SRVREQ Notification: Incoming client's connection request	●	⊙		
0.	+KTCP_DATA: Incoming Data through a TCP Connection	○	⊙		
13.4.9	+KTCP_DATA Notification: Incoming data through a TCP Connection	●	⊙	X	X
13.4.10.	+KURCCFG: Enable or disable the URC from TCP commands	●	⊙		
13.4.11.	+KTCPSTAT: Get TCP socket status	●	⊙		
13.4.12.	+KTCPSTART: Start a TCP connection in direct data flow	●	⊙		
13.4.13	+KTCP_ACK: Status Report for Latest TCP	○	⊙		
13.4.14	+KTCPACKINFO: Poll ACK Status for the Latest	○	⊙		
13.5.	**FTP Client Specific Commands**				
13.5.1.	+KFTPCFG: FTP Configuration	●	⊙	x	x
13.5.2.	+KFTPRCV: Downloading FTP files	●	⊙	X	X
13.5.3.	+KFTPSND: Uploading FTP files	●	⊙	x	X
13.5.4.	+KFTPDEL: Deleting FTP files	●	⊙	X	x
13.5.5.	+KFTPCLOSE: Ending current FTP connection	●	⊙	x	x
13.6.	**FTP Server Specific Commands**				
13.6.1.	+KFTPDCFG: FTP Server Configuration	●	⊙		
13.6.2.	+KFTPDSTAT: FTP Server Status	●	⊙		
13.6.3.	+KFTPDRUN: Run FTP server	●	⊙		
13.6.4.	+KFTPD_NOTIF Notification: Server's Event Notification	●	⊙		
13.6.5.	+KFTPDKICK: Kick user from FTP server	●	⊙		
13.6.6.	+KFTPDCLOSE: Close FTP Server	●	⊙		
13.7.	**UDP Specific Commands**				
13.7.1.	+KUDPCFG: UDP Connection Configuration	●	⊙	x	X
13.7.2.	+KUDPCLOSE: Closing current UDP operation	●	⊙	X	x
13.7.3.	+KUDPSND: Sending data through an UDP Connection	●	⊙	X	X
13.7.4.	+KUDPRCV: Receiving data through an UDP Connection	●	⊙	x	X
13.7.5.	+KUDP_DATA Notification: Incoming data through a UDP Connection	●	⊙	x	x

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13.8.	**SMTP Specific Commands**				
13.8.1.	+KSMTPPARAM: Connection Configuration	●	⊙		
13.8.2.	+KSMTPPWD: Authentication Configuration	●	⊙		
13.8.3.	+KSMTPTO: Receivers Configuration	●	⊙		
13.8.4.	+KSMTPSUBJECT: Subject Configuration	●	⊙		
13.8.5.	+KSMTPUL: Send Message	●	⊙		
13.8.6.	+KSMTPCLEAR: Clear Parameters	●	⊙		
13.9.	**POP3 Specific Commands**				
13.9.1.	+KPOPCNX: Connection Configuration	●	⊙		
13.9.2.	+KPOPLIST: List Available Mail	●	⊙		
13.9.3.	+KPOPREAD: Download A Mail	●	⊙		
13.9.4.	+KPOPDEL: Delete a Mail	●	⊙		
13.9.5.	+KPOPQUIT: Close Connection	●	⊙		
13.10.	**HTTP Client Specific Commands**				
13.10.1.	+KHTTPCFG: HTTP Connection Configuration	●	⊙		
13.10.2.	+KHTTPHEADER: Set the header of the request	●	⊙		
13.10.3.	+KHTTPGET: Get information from HTTP server	●	⊙		
13.10.4.	+KHTTPHEAD: Get the head of the information from HTTP server	●	⊙		
13.10.5.	+KHTTPPOST: Send data to HTTP server	●	⊙		
13.10.6.	+KHTTPCLOSE: Close a HTTP connection	●	⊙		
13.11.	**HTTPS Client Specific Commands**				
13.11.1.	+KHTTPSCFG: HTTPS Connection Configuration	○	⊙		
13.11.2.	+KHTTPSHEADER: Set the header of the request	○	⊙		
13.11.3.	+KHTTPSGET: Get information from HTTP server	○	⊙		
13.11.4.	+KHTTPSHEAD: Get the head of the information from HTTP server	○	⊙		
13.11.5.	+KHTTPSPOST: Send data to HTTP server	○	⊙		
13.11.6.	+KHTTPSCLOSE: Close a HTTPS connection	○	⊙		
13.12.	**SSL Certificate Manager**				
13.12.1.	+KCERTSTORE: Store root CA and local certificates to file system	○	●		
13.12.2.	+KPRIVKSTORE: Store private key associated to local certificate	○	●		
13.12.3.	+KCERTDELETE: Delete local certificate from the index	○	●		
14.	**Specific flash commands**				
14.1.	+KFSFILE : Flash file operation command	●	●	x	x
15.	**MMS commands**				
15.6.	+KMMCNF Command: MMS Configuration	●	⊙		
15.7.	+KPSL Command: List of Objects	●	⊙		
15.8.	+KPSR Command: Reading an Object	●	⊙		

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15.9.	+KPSW Command: Writing an object	●	⊙		
15.10.	+KPSD Command: Deleting an Object	●	⊙		
15.11.	+KPSSEND Command: Send MMS	●	⊙		
15.12.	+KPSCAP Command: Retrieving MOBILE capabilities	●	⊙		
15.13.	+KMMRET Command: Retrieve MMS	●	⊙		
15.14.	+KMMA Notification: MMS In MMSC Notification	●	⊙		
15.15.	+KMMREC Notification: MMS in ME Notification	●	⊙		
16.	**ECALL commands**				
16.2	+KECALLCFG	○	●		X
16.3	+KECALL	○	⊙		X
16.4	+KAECALL	○	⊙		X
16.5	+KECALLMSD	○	●		X
16.6	+KECALLVSN	○	●		x
17.	**GNSS commands (for HiAll NC and HiLoNC3GPS)**				
17.4	+KGNSSRUN	○	●		X
17.5	+KNMEARCV	○	●		X
17.6	+KGNSSFIX	○	●		X
17.7	+KGNSSRST	○	●		X
17.8	+KGNSSHIST	○	●		X
17.9	+KGNSSLTOACT	○	⊙		
17.10	+KGNSSLTOCFG	○	⊙		
17.11	+KGNSSLTOGET	○	⊙		
17.12	+KUARTCFG	○	●		X
17.13	+KGNSSVSN	○	●		X

18.6. Appendix 6: How to Use TCP Commands

18.6.1. Client mode

AT&K3 OK	**Hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",”0.0.0.0”,”0.0.0.0”,”0.0.0.0” OK	**Set GPRS parameters (APN, login, password…)**
AT+KTPCFG=0,0,"www.google.com",80 +KTCPCFG: 1 OK	**Set IP address and port number**
AT+KTCPCNX=1 OK	**Initiate the connection**
AT+KTCPSND=1,18 CONNECT …Data send… OK	**Send data with KPATTERN string at the end. e.g. “GET / HTTP/1.0** **--EOF--Pattern--"**
+KTCP_DATA: 1,1380 **AT+KTCPRCV=1**, 1380 CONNECT HTTP/1.0 200 OK Cache-Control: private, max-age=0 … a lot of data… --EOF--Pattern-- OK	**DATA read**
+KTCP_DATA: 1,1380 **AT+KTCPRCV=1,1380** CONNECT er{padding-bottom:7px !important}#gbar,#guser{font- … a lot of data… --EOF--Pattern-- OK	**+KTCP_DATA notification :** **DATA read**
+KTCP_DATA: 1,1380 **AT+KTCPCLOSE=1,1** OK	**Close session 1**
AT+KTCPDEL=1 OK	**Delete session 1**
AT+KTCPCFG? OK	**No session is available**

18.6.2. Server mode

In this simple example we emulate a daytime server. This server listens to port 13 and for each connection it returns the date.

AT&K3 OK	**Hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",”0.0.0.0”,”0.0.0.0”,”0.0.0.0” OK	**Set GPRS parameters (APN, login, password…)**
AT+KTCPCFG=0,1,,13 +KTCPCFG: 1 OK	**Set TCP listener and port number**
AT+KTCPCNX=1 OK	**Initiate the server**
AT+KCGPADDR +KCGPADDR: **0**,”10.35.125.89” OK	**Get the IP address to initiate a connection request with a client**
+KTCP_SRVREQ: 1,2	**A client requests a connection (session ID 2)**
AT+KTCPSND=2,15 CONNECT …Date and time… OK	**DATA sent to the client read**
+KTCP_SRVREQ: 1,3	**Another client requests a connection (session ID 3) CHILD mode for session 3**
+KTCP_NOTIF: 2, 4	**Client (session 2) closes the connection.**
AT+KTCPSND=3,15 CONNECT …Date and time… OK	**DATA sent to the client**
AT+KTCPCLOSE=3,1 OK	**Close client session 3 and then session 3 is deleted automatically (CHILD mode for session 3)**
AT+KTCPCLOSE=1,1 OK	**Close server: session 1**
AT+KTCPDEL=1 OK	**Delete session 1**

18.6.3. Polling for the status of a socket

AT&K3 OK	**Hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",”0.0.0.0”,”0.0.0.0”,”0.0.0.0” OK	**Set GPRS parameters (APN, login, password…)**
AT+KTCPCFG=0,0,"www.google.com",80 +KTCPCFG: 1 OK	**Set TCP Server address and port number** **Returns the session_id : 1**
AT+KURCCFG=”TCP”,0 OK	**Disable TCP unsolicited messages**
AT+KTCPCNX=1 OK	**Initiate the connection, use session 1**
AT+KTCPSTAT=1 +KTCPSTAT : 3,-1,0,0 OK	**Poll the connection status :** **Connection is UP**
AT+KTCPSND=1,3000 CONNECT …Data send… OK	**Send data on socket 1, we expect to send 3000 bytes but you can send less.** **You can send data after CONNECT** **To finish send the KPATTERN (EOF), you can define this with +KPATTERN command.**
AT+KTCPSTAT=1 +KTCPSTAT : 3,-1,1234,0 OK	**Poll the connection status :** **Connection is UP, there are 1234 bytes not yet sent**
AT+KTCPSTAT=1 +KTCPSTAT : 3,-1,100,0 OK	**Poll the connection status :** **Connection is UP, there are 100 bytes not yet sent**
AT+KTCPSTAT=1 +KTCPSTAT : 3,-1,0,0 OK	**Poll the connection status :** **Connection is UP, all bytes have been sent**
AT+KTCPSTAT=1 +KTCPSTAT : 3,-1,0,320 OK	**Poll the connection status :** **Connection is UP, 320 bytes are available for reading**
AT+KTCPRCV=1,320 CONNECT … a lot of data… --EOF--Pattern-- OK	**Read 320 bytes on socket 1** **Data are sent after CONNECT** **Receive KPATTERN**
AT+KTCPCLOSE=1,1 OK	**Close session 1**
AT+KTCPDEL=1 OK	**Delete session 1**

18.6.4. End to End TCP connection

AT&K3 OK	**Hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",”0.0.0.0”,”0.0.0.0”,”0.0.0.0” OK	**Set GPRS parameters (APN, login, password…)**
AT+KTCPCFG=0,0,"www.google.com",80 +KTCPCFG: 1 OK	**Set TCP Server address and port number** **Returns the session_id : 1**
AT+KTCPSTART=1 CONNECT …Data sent……Data received……Data sent… …Data sent……Data received……Data sent… **+++** OK	**Initiate the connection, use session 1** **Message CONNECT : connection to server is established, you can send data** **Use +++ to enter in command mode**
ATO1 CONNECT …Data sent……Data received……Data sent… …Data sent……Data received……Data sent… OK	**Use ATO<session_id> to switch back in data mode** **Toggle DTR (if AT&D1 or AT&D2 configuration) to enter in command mode**
AT+KTCPCLOSE=1,1 OK	**Use KTCPCLOSE to close the session**
AT+KTCPDEL=1 OK	**Delete the configured session**

18.6.5. Error Case For End to End TCP connection

AT+KTCPSTART=1 NO CARRIER +KTCP_NOTIF: 1,<tcp_notif>	**Try to Initiate the connection,** **Connection fails, see the value of <tcp_notif>**
AT+KTCPSTART=1 CONNECT …Data sent……Data received……Data sent… …Data sent……Data received……Data sent… NO CARRIER +KTCP_NOTIF: 1,<tcp_notif>	**Initiate the connection** **Exchange some data** **An error occurs during connection (network lost, server closed…)**

18.6.6. Use cases for AT+KTCPACKINFO and <URC-ENDTCP-enable> option

This section describes the behavior of AT+KTCPACKINFO when the <URC-ENDTCP > option is used with AT+KTCPCFG.

18.6.6.1. <URC-ENDTCP-enable> is disabled (default setting)

AT+KCNXCFG=0,"GPRS","CMNET"

OK

AT+KTCPCFG=0,0,"202.170.131.76",2000

+KTCPCFG: 1

OK

AT+KTCPCFG?

+KTCPCFG: 1,0,0,0,,"202.170.131.76",2000,,0,**0** //<URC-ENDTCP-enable> is disabled

OK

AT+KTCPCNX=1 //connect to TCP server

OK

AT+KTCPSND=1,10 //Use command to send 10 bytes

CONNECT

// write to serial: 0123456789--EOF--Pattern--

OK

//The URC “+KTCP_ACK” is not displayed

AT+KTCPACKINFO=1

+CME ERROR: operation not allowed //Since <URC-ENDTCP-enable> is disabled, this returns error.

18.6.6.2. <URC-ENDTCP-enable> is enabled

AT+KCNXCFG=0,"GPRS","CMNET"

OK

AT+KTCPCFG=0,0,"202.170.131.76",2000,,,**1** //Set <URC-ENDTCP-enable> to 1, enable URC “+KTCP_ACK”.

+KTCPCFG: 1

OK

AT+KTCPCFG?

+KTCPCFG: 1,0,0,0,,"202.170.131.76",2000,,0,1 //<URC-ENDTCP-enable> is enabled

OK

AT+KTCPCNX=1 //connect to TCP server

OK

AT+KTCPSND=1,10 //Use command to receive those 10 bytes

CONNECT

// write to serial: 0123456789--EOF--Pattern--

OK

…..

+KTCP_ACK: 1, 1 //Only after a short time, URC "+KTCP_ACK" tells us the latest TCP data arrived remote side.

AT+KTCPACKINFO=1 //We can use this command to poll the status of the latest TCP data.

+KTCPACKINFO: 1, 1

OK

AT+KTCPSND=1,1000 //Use command to send 1000 bytes

CONNECT

// write to serial: 1000bytes and --EOF--Pattern--

OK

… //URC "+KTCP_ACK" not got yet.

AT+KTCPACKINFO=1 //After a few seconds, this command can be used to poll the status of the latest TCP data.

+KTCPACKINFO: 1, 2 //The status of the latest TCP data is unknown.

OK

…

+KTCP_ACK: 1, 0 //Since the "OK" of the latest "+KTCPSND", 64 seconds elapsed.

//URC "+KTCP_ACK" indicates that data has not arrived on remote side yet.

//Network may be too bad

AT+KTCPACKINFO=1 //We can use this command to poll the status of the latest TCP data.

+KTCPACKINFO: 1, 0 //The status of the latest TCP data is "failure": not all data has been received by remote side.

OK

18.7. Appendix 7: How to Use FTP Specific Commands

18.7.1. Client mode

AT&K3 OK	**Hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",,, OK	**Set GPRS parameters (APN, login, password…)**
AT+KFTPCFG=0,"ftp.test.fr","userlogin","userpassw	**Set FTP server address, login, password and port**

ord",21,0 OK	**number**
AT+KPATTERN="--EOF--Pattern--" OK	**Custom End Of File pattern**
AT+KFTPSND=0,,"Dir","TestFile.txt",0 CONNECT …send Data … **...send<--EOF—Pattern>...** OK	**Send data, store them in "TestFile.txt" file. After "CONNECT". Do not forget send the EOF string.**
AT+KFTPRCV=0,,"Dir","Testfile.txt",0 CONNECT **F6E6E656374696F6E20746573742E--EOF--Pattern--** OK	**Read the file named "TestFile.txt" from ftp server, data are sent and end by EOF string.**
AT+KFTPRCV=0,"/flashfile.ext","Dir","fsfile.txt",0 OK +KFTP_RCV_DONE:0	**Get file "fsfile.txt" from ftp server, and store it in flash directory "/flashfile.ext".**
AT+KFTPSND=0,"/flashfile.ext","Dir","fsfile.txt",0 OK +KFTP_SND_DONE:0	**Send flash file "/flashfile.txt" to ftp server, store it in "Dir" directory.**
AT+KFTPDEL=0,"Dir","TestFile.txt" OK	**Delete the file called "TestFile.txt" in ftp server**
AT+KFTPCLOSE=0 OK	**Then you can close the connection**

18.7.2. Server mode

AT&K3 OK	**Hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",,, OK	**Set GPRS parameters (APN, login, password…)**
AT+KFTPDCFG=0,1,"/ftp","IEUser@",21 OK	**Set FTP root path, password and port number**
AT+KFTPDRUN=1 +KFTPDRUN:"192.168.1.44" OK	**Run FTP server** *You can connect to HiLo ftp server now.* If you need accessing HiLo ftp server in programming, Please see RFC959.

AT+KFTPDCLOSE OK	**Close the ftp server**

18.7.3. "FTP Resume" use case

18.7.3.1. Resume feature when transmitting data to serial link

AT+KCNXCFG=0,"GPRS","CMNET"

OK

AT+KFTPCFG=0,"202.170.131.76","administrator","8ik,(OL>",21,0

+KFTPCFG: 0

OK

AT+KFTPRCV=0,,"111111.txt",0

CONNECT

750aaaaaaaaa….. aaaaa250bbbbbbb--EOF--Pattern— **/* Count the total data from serial link, it is 760 */**

+KFTP_ERROR : 0, **421** **/* The result code indicates that the download met some problems, it may be due to control or data connection lost */**

/* Try to resume transfer as follows: */

AT+KFTPRCV=0,,"111111.txt",0,760 **/* Already got 760 bytes totally, so set it as offset to resume transfer*/**

bbbbbb……bbbbbbbbend--EOF--Pattern— **/* Count the total data from serial link, it is 240 */**

OK **/* This indicates that the download was successful.*/**

/* Now we can combine the data from the two downloads. As a result, we will get the complete file "111111.txt" */

AT+KFTPRCV=0,,,"111111.txt",0,119111 **//Try to set an invalid offset.**

CONNECT

--EOF--Pattern--

OK **// Nothing can be got because server has no corresponding error code and it answers that transfer is finished.**

18.7.3.2. Resume feature when downloading data to file system

AT+KFSFILE=4,"/ftp"

+KFSFILE: 1048407 bytes free **/*The target file does not exist in flash*/**

OK

AT+KCNXCFG=0,"GPRS","CMNET"

OK

AT+KFTPCFG=0,"202.170.131.76","administrator","8ik,(OL>",21,0

+KFTPCFG: 0

OK

// Download is starting

AT+KFTPRCV=0,"/11",,"111111.txt"

OK

AT+KFSFILE=4,"/ftp"

+KFSFILE: <F> 11 760 **/*totally got 760 bytes*/**

+KFSFILE: 1042921 bytes free

OK

+KFTP_ERROR : 0, 2 **/* Some problems caused the transfer broke */**

/* Transfer not finished, try to resume */

AT+KFTPRCV=0,"/11",,"111111.txt",0,1 **/* To resume transfer file in flash, we only have to set the offset to non-zero.**

Then the Module will detect the real size of the file in file system automatically.

The real size will be used as the real <offset> to resume transfer. */

OK

AT+KFSFILE=4,"/ftp"

+KFSFILE: <F> 11 1000 **/*So far, totally got 1000 bytes*/**

+KFSFILE: 1042921 bytes free

OK

+KFTP_RCV_DONE:0 **/* This URC indicate that transfer is finished */**

+KFTP_ERROR : 0, 421 **/* Server kicked off the connection*/**

AT+KFSFILE=4,"/ftp"
+KFSFILE: <F> 11 1000
+KFSFILE: 1042921 bytes free
OK

18.7.3.3. Use case when FTP server does not support the resume feature

AT+KCNXCFG=0,"GPRS","CMNET"
OK

AT+KFTPCFG=0,"202.170.131.76","administrator","8ik,(OL>",21,0
+KFTPCFG: 0
OK

AT+KFTPRCV=0,,,"111111.txt",0
CONNECT
750aaaaaaaaa….. aaaaa250bbbbbbb--EOF--Pattern— **/* Count the total data from serial link, it is 760 */**
+KFTP_ERROR : 0, **421** **/* The result code indicates that the download met some problems, it may be due to control or data connection lost */**

AT+KFTPRCV=0,,,"111111.txt",0,**760**
CONNECT
--EOF--Pattern—
+KFTP_ERROR : 0, 502 **// ERROR 502 means that some commands in the procedure are not supported by server**

18.8. Appendix 8: How to Use UDP Specific Commands

18.8.1. Client mode

AT&K3 OK	**Hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",,, OK	**Set GPRS parameters (APN, login, password…)**
AT+KUDPCFG=0,0 +KUDPCFG: 1 OK	**Create a new UDP socket (returned session 1) with the parameters associated to the connection profile id number 0**
AT+KUDPSND= 1,"82.234.17.52",32,18 CONNECT …Data sent… --EOF--Pattern-- OK	**Send UDP data after "CONNECT". Do not forget the PATTERN characters at the end. For example :** "Data sent--EOF--Pattern--"
+KUDP_DATA: 1,35	**Received notification that indicates the presence of 35 bytes in the socket**
AT+KUDPRCV=1, 35 CONNECT This is a simple UDP Protocol test. -EOF--Pattern-- OK	**Try to read 35 bytes from session 1**
+KUDP_RCV: "82.234.17.52",32	
+KUDP_DATA: 1,35	**Received notification that indicates the presence of 35 bytes in the socket**
AT+KUDPRCV=1, 16 CONNECT This is a simple -EOF--Pattern-- OK	**Same test but try to read 16 bytes from session 1:**
+KUDP_DATA_MISSED: 1,19	**there are 19 unread bytes left and missed in the UDP socket**
AT+KUDPCLOSE=1 OK	**Definitely close the UDP session and at the same time session is deleted**
AT+KUDPCFG? **OK**	**No sessions are available now**

18.8.2. Server mode

AT&K3 OK	**Hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",”0.0.0.0”,”0.0.0.0”,”0.0.0.0” OK	**Set GPRS parameters (APN, login, password…)**
AT+KUDPCFG=0,1,3000 +KUDPCFG: 1 OK	**Set UDP listener(Port 3000)** **Initiate the server. Session ID is 1**
AT+KUDPCFG? +KUDPCFG: 1,0,1,3000 OK	**Check the server be initiated**
AT+KCGPADDR +KCGPADDR: 0, "192.168.0.71" OK	**Get local IP address and let client know**
+KUDP_DATA: 1,9	**Data come in from some client**
AT+KUDPRCV=1,9 CONNECT DATA TEST--EOF--Pattern-- OK	**Receive data and display**
+KUDP_RCV: "10.10.10.5",1111	**These data was from "10.10.10.5"(Port:1111)**
AT+KUDPSND=1,”10.10.10.5”,3100,18 CONNECT OK	**Send 18Bytes to a remote server(Port:3100)** **Some data with "-EOF--Pattern--" in the end**
AT+KUDPCLOSE=1 OK	**Close the UDP server and at the same time session is deleted**
AT+KUDPCFG? OK	**No sessions are available now**

18.8.3. Use cases for KTCP_DATA and KUDP_DATA (with/without data auto retrieval)

1) Previous features are kept (ascending compatibility of the AT commands) - Client mode

AT+KCNXCFG=0,"GPRS","CMNET"

OK

AT+KTCPCFG=0,0,"202.170.131.76",2000

+KTCPCFG: 1

OK

AT+KTCPCNX=1 //connect to TCP server

OK

+KTCP_DATA: 1,10 //URC tells us that 10 bytes arrived
AT+KTCPRCV=1,10 //Use KTCPRCV command to receive those 10 bytes
CONNECT
0123456789--EOF--Pattern--
OK

AT+KUDPCFG=0,0 //open a UDP socket
+KUDPCFG: 2
OK
+KUDP_DATA: 2,8 //URC tells us that 8 bytes arrived
AT+KUDPRCV=2,8 //Use command to receive those 8 bytes
CONNECT
01234567--EOF--Pattern--
OK
+KUDP_RCV: "202.170.131.76",2001

2) Previous features are kept (ascending compatibility of the AT commands) - Server mode
AT+KTCPCFG=0,1,,13 //Configure a TCP server socket
+KTCPCFG: 1
OK
AT+KTCPCNX=1 //Open the listen port
OK
AT+KCGPADDR
+KCGPADDR: 0,”10.35.125.89”
OK
+KTCP_SRVREQ: 1,2 //Session 2 is set
+KTCP_SRVREQ: 1,3 //Session 3 is set
+KTCP_DATA: 2,10 //URC tells us that 10 bytes arrived in session 2
+KTCP_DATA: 3,8 //URC tells us that 8 bytes arrived in session 3

AT+KTCPRCV=2,10 //Use command to receive those 10 bytes in session 2
CONNECT
0123456789--EOF--Pattern--
OK

AT+KTCPRCV=3,8 //Use command to receive the 8 bytes in session 3
CONNECT
01234567--EOF--Pattern--
OK

AT+KUDPCFG=0,1,3000 //Open a UDP socket, server mode

+KUDPCFG: 4

OK

+KUDP_DATA: 4,8 //URC tells us that 8 bytes arrived

AT+KUDPRCV=4,8 //Use command to receive those 8 bytes

CONNECT

01234567--EOF--Pattern--

OK

+KUDP_RCV: "202.170.131.76",2001

3) New optional feature: URC takes out the data - Client mode

AT+KCNXCFG=0,"GPRS","CMNET"

OK

AT+KTCPCFG=0,0,"202.170.131.76",2000,,**1** //Extend a parameter for the new feature.

//When setting to 1, data will be received by the URC “+KTCP_DATA:”

+KTCPCFG: 1

OK

AT+KTCPCNX=1 //Connect to TCP server

OK

+KTCP_DATA: 1,**10**,**0123456789** //10 bytes arrived. The URC takes them out directly

AT+KUDPCFG=0,0,3000,**1** //Extend a parameter for the new feature.

//When setting to 1, data will be received by the URC “+ KUDP_DATA:”

+KUDPCFG: 2

OK

+KUDP_DATA: 2,**8**,"202.170.131.76",2001,01234567 //8 bytes arrived. The URC takes them out directly

4) New optional feature: URC takes out the data - Server mode

AT+KTCPCFG=0,1,,13,**1** //Extend a parameter for the new feature.

//When setting to 1, all child connection will display data in URC mode.

//Data will be received by the URC “+KTCP_DATA:”

+KTCPCFG: 1

OK

AT+KTCPCNX=1 //Open the listen port

OK

AT+KCGPADDR

+KCGPADDR: 0,”10.35.125.89”

OK

+KTCP_SRVREQ: 1,2

+KTCP_SRVREQ: 1,3

+KTCP_DATA: 2,10,**0123456789** //10 bytes arrived. The URC takes them out directly

+KTCP_DATA: 3,8,**01234567** //8 bytes arrived. The URC takes them out directly

AT+KUDPCFG=0,1,3000,**1** //Open a UDP socket, server mode
//Extend a parameter for the new feature.
//Data will be received by the URC "+KUDP_DATA:"

+KUDPCFG: 4

OK

+KUDP_DATA: 4,**8**,"202.170.131.76",2001,01234567 //8 bytes arrived. The URC takes them out directly

18.9. Appendix 9: How to Use Mail Specific commands

18.9.1. Mail overview

The aim of this overview is to give several bases about how to build a mail body with or without attachment. For a better understanding of mail transfer we recommend the reading of the following RFCs:

- RFC 2822 or STD11: Internet Message Format.
- RFC 2045: Multipurpose Internet Mail Extensions Part 1.
- RFC 2046: Multipurpose Internet Mail Extensions Part 2.
- RFC 2047: Multipurpose Internet Mail Extensions Part 3.
- RFC 2049: Multipurpose Internet Mail Extensions Part 5.

18.9.1.1. Mail layout

Messages are divided into lines of characters. These lines are delimited with the two characters carriage-return and line-feed; that is, the carriage return (CR) character (ASCII value 13) followed immediately by the line feed (LF) character (ASCII value 10). The carriage-return/line-feed pair will be written in this document as CRLF.)

A message consists of header fields (collectively called "the header of the message") followed by a body. The header is a sequence of lines of characters with special syntax that are used to describe the mail environment (from whom, for whom, when, subject, body format …). The body is simply a sequence of characters that follows the header and is separated from the header by an empty line (i.e., a line with nothing preceding the CRLF).

Note: *From the RFC, There are two limits that this standard places on the number of characters in a single line. Each line of characters must be no more than 998 characters, and should be no more than 78 characters, excluding the CRLF.*

18.9.1.2. Mail header

Header fields are lines composed of a field name, followed by a colon (":"), followed by a field body, and terminated by CRLF. The header must only be composed of US-ASCII characters. Here is an example of field presents in a mail header:

MIME-Version: 1.0<*CRLF*>

to: first.receiver@a.domain.com, second.receiver@a.domain.com<*CRLF*>

cc: first.copy@a.domain.com<*CRLF*>

from: sender@another.domain.com<*CRLF*>

subject: mail example<*CRLF*>

<*CRLF*>

The first field is to assume conformity with the MIME specification. The others fields will be parsed by the mail application to present the message.

The header is closed by the last empty line, each character behind will be considered as part of the body.

18.9.1.3. Mail body

The body of a message is simply lines of US-ASCII characters. The only two limitations on the body are as follows:

- CR and LF MUST only occur together as CRLF; they MUST NOT appear independently in the body.
- Lines of characters in the body MUST be limited to 998 characters, and SHOULD be limited to 78 characters, excluding the CRLF.

Note: *The mail attachments are encapsulated in the body and defined with specific header fields of the header, these are called multipart messages (18.9.2.1)*

Here is the example of a simple mail:

MIME-Version: 1.0<*CRLF*>

to: first.receiver@a.domain.com<*CRLF*>

cc: first.copy@a.domain.com<*CRLF*>

from: sender@another.domain.com<*CRLF*>

subject: Simple mail example<*CRLF*>

<*CRLF*>

Hello,<*CRLF*>

<*CRLF*>

This is a mail example<*CRLF*>

<*CRLF*>

BR. <*CRLF*>

<*CRLF*>

18.9.2. Mail Attachment

18.9.2.1. Multipart message

As we have seen before, attachments are enclosed in the message body. This kind of message is called multipart messages. Multipart messages are defined by a field in the header, the usual format is:

Content-type: multipart/mixed; boundary=<some text or hash><CRLF>

This field "*Content-Type*" defines the body as a suite of part separated by boundaries – Note that with MIME 1.0 specifications the field "*Content-type*" can be omitted and the default value is "*Content-type : text/plain; charset=us-ascii*" which means a simple body in US-ASCII characters.

Boundaries format is a double hyphen, "--", followed by the boundary value defined in the header field and the CRLF pair. In order to signify the end of the body, we use a special form of the boundary that format is a double hyphen followed by the boundary value, another double hyphen and the CRLF pair.

Each part is structured as a regular internet message with a header that describes the content and the body. The content of each part is also described by the field "*Content-type*".

Here is an example of two part message:

MIME-Version: 1.0<*CRLF*>

to: first.receiver@a.domain.com<*CRLF*>

from: sender@another.domain.com<*CRLF*>

subject: Multipart mail example<*CRLF*>

Content-type: multipart/mixed; boundary=myboundary<*CRLF*>

<*CRLF*>

--myboundary<*CRLF*>

Content-type : text/plain; charset=us-ascii<*CRLF*>

<*CRLF*>

this is the first part<*CRLF*>

<*CRLF*>

--myboundary<*CRLF*>

<*CRLF*>

This is the second part<*CRLF*>

<*CRLF*>

--myboundary--<*CRLF*>

In the first part, the content type of the body is specified and, as the second part does not specify anything, both are US-ASCII text.

18.9.2.2. Attachment format

As the body must only embed US-ASCII characters, the payload attached can be encoded. The encoding algorithm is signified in the part's header with the field "*Content-transfer-encoding*". The commonly used encoding algorithm is Base64

The MIME type of attachment is described by the "*Content-type*" field in the part's header. For example, to send the image file landscape.jpg, build the following message:

MIME-Version: 1.0<*CRLF*>

to: first.receiver@a.domain.com<*CRLF*>

from: sender@another.domain.com<*CRLF*>

subject: Image example<*CRLF*>

Content-type: multipart/mixed; boundary=myboundary<*CRLF*>

<*CRLF*>

--myboundary<*CRLF*>

Content-type : text/plain; charset=us-ascii<*CRLF*>

<*CRLF*>

Hello,<*CRLF*>

Here is the image I was talking about :<CRLF>

<*CRLF*>

--myboundary<*CRLF*>

Content-type: image/jpeg; name="landscape.jpg"<*CRLF*>

Content-transfer-encoding: base64<*CRLF*>

<*CRLF*>

“base64 encoded file”<*CRLF*>

<*CRLF*>

--myboundary--<*CRLF*>

18.9.3. How to Use SMTP Specific Commands

18.9.3.1. Simple mode

We send the following mail to *receiver.addr@domain* and *copy.addr@domain*:

Hello,<*CRLF*>

<*CRLF*>

This is a mail example<*CRLF*>

<*CRLF*>

BR. <*CRLF*>

<*CRLF*>

And another mail to receiver.addr@domain only:

Hello,<*CRLF*>

<*CRLF*>

I forgot to tell…<*CRLF*>

<*CRLF*>

AT&K3 OK	**hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",,, OK	**Set GPRS parameters (APN, login, password…)**

AT+KCNXTIMER=0,60,2,70 OK	**Set Timers**
AT+KCNXPROFILE=0 OK	**Activate GPRS profile**
AT+CGATT=1 OK	**Be sure to attach to the network**
AT+KSMTPPARAM=”smtp.domain.com”, 580, “sender.addr@domain” +KSMTPPARAM: **”smtp.domain.com”, 580, “sender.addr@domain”** OK	**Fill in the connection parameters, the SMTP server URL is smtp.domain.com at port 580**
AT+KSMTPPWD=”mylogin”,”mypassword” +KSMTPPWD: **”mylogin”, “mypassword”** OK	**Fill in the authentication parameters**
AT+KSMTPTO=”receiver.addr@domain”,””,”copy.addr@domain”,”” +KSMTPTO: **”receiver.addr@domain”,,”copy.addr@domain”,** OK	**Fill in the receiver parameters, one direct and a copy**
AT+KSMTPSUBJECT=”Simple mail example” +KSMTPSUBJECT: **”Simple mail example”** OK	**Fill in the subject parameter**
AT+KSMTPUL=1,46 +KSMTPUL: 1 CONNECT <*CRLF*> Hello,<*CRLF*> <*CRLF*> This is a mail example<*CRLF*> <*CRLF*> BR. <*CRLF*> <*CRLF*> OK	**Send the mail in simple mode, we send 46 bytes to the module** **The module connect the SMTP server and send the header:** MIME-Version: 1.0<*CRLF*> to: receiver.addr@domain<*CRLF*> cc: copy.addr@domain<*CRLF*> from: sender.addr@domain<*CRLF*> subject: Simple mail example<*CRLF*> <*CRLF*> **“1” is the session id of current SMTP connection** **During uploading,** --EOF--Pattern-- **can be used to terminate current uploading** **The mail is successfully sent**
AT+KSMTPTO=”receiver.addr@domain”,””,””,”” +KSMTPTO: **”receiver.addr@domain”,,,** OK	**We prepare to send the second mail** **Fill in the receiver parameter.**

AT+KSMTPSUBJECT=”Second mail example” +KSMTPSUBJECT: **”Second mail example”** OK	**Fill in the subject parameter.**
AT+KSMTPUL=1,36	**Send the mail in simple mode, we send 36 bytes to the module.** **The module connect the SMTP server and send the header:** MIME-Version: 1.0<*CRLF*> to: receiver.addr@domain<*CRLF*> from: sender.addr@domain<*CRLF*> subject: Second mail example<*CRLF*> <*CRLF*>
CONNECT <*CRLF*> Hello,<*CRLF*> <*CRLF*> I forgot to tell…<*CRLF*>	**During uploading,** --EOF--Pattern-- **can be used to terminate current uploading**
<*CRLF*> OK	**The mail is successfully sent**
AT+KSMTPCLEAR OK	**Clear the parameter’s set**

18.9.3.2. Complex mode

To send a mail to *receiver.addr@domain* with the image *landscape.jpg* attached. In complex mode the first part of the header is handled by the module thus we will send the following data through the KSMTPUL Command:

Content-type: multipart/mixed; boundary=myboundary<*CRLF*>

<*CRLF*>

--myboundary<*CRLF*>

<*CRLF*>

Hello,<*CRLF*>

<*CRLF*>

Here is the image I was talking about :<CRLF>

<*CRLF*>

--myboundary<*CRLF*>

Content-type: image/jpeg; name="landscape.jpg"<*CRLF*>

Content-transfer-encoding: base64<*CRLF*>

<*CRLF*>

AR15qfGTmlk[...]AAADJqdf462==<*CRLF*>

<*CRLF*>

--myboundary--<*CRLF*>

Note: The encoded file in this example is not complete. We assume that the final size of the whole data block to send is 15360.

AT&K3 OK	**hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",,, OK	**Set GPRS parameters (APN, login, password…)**
AT+KCNXTIMER=0,60,2,70 OK	**Set Timers**
AT+KCNXPROFILE=0 OK	**Activate GPRS profile**
AT+CGATT=1 OK	**Be sure to attach to the network**
AT+KSMTPPARAM=”smtp.domain.com”, 580, “sender.addr@domain” +KSMTPPARAM: **”smtp.domain.com”, 580, “sender.addr@domain”** OK	**Fill in the connection parameters, the SMTP server URL is smtp.domain.com at port 580**
AT+KSMTPPWD=”mylogin”,”mypassword” +KSMTPPWD: **”mylogin”, “mypassword”** OK	**Fill in the authentication parameters**
AT+KSMTPTO=”receiver.addr@domain”,””,””,”” +KSMTPTO: **”receiver.addr@domain”,,””,** OK	**Fill in the receiver parameters, one direct and a copy**
AT+KSMTPSUBJECT=”Complex mail example” +KSMTPSUBJECT: **”Complex mail example”** OK	**Fill in the subject parameter**
AT+KSMTPUL=0,15360 +KSMTPUL: 1 CONNECT Content-type:multipart/mixed; boundary=myboundary<*CRLF*> <*CRLF*> --myboundary<*CRLF*> <*CRLF*> Hello,<*CRLF*> <*CRLF*> Here is the image I was talking about :<CRLF>	**Send the mail in simple mode, we send 15360 bytes to the module** **The module connect the SMTP server and send the first part of the header:** MIME-Version: 1.0<*CRLF*> to: receiver.addr@domain<*CRLF*> from: sender.addr@domain<*CRLF*> subject: Complex mail example<*CRLF*> **“1” is the session id of current SMTP connection**

<*CRLF*> --myboundary<*CRLF*> Content-type: image/jpeg; name="landscape.jpg"<*CRLF*> Content-transfer-encoding: base64<*CRLF*> <*CRLF*> AR15qfGTmlk[...]AAADJqdf462==<*CRLF*> <*CRLF*> --myboundary--<*CRLF*> OK	**During uploading, --EOF--Pattern-- can be used to terminate current uploading**
	The mail is successfully sent
AT+KSMTPCLEAR OK	**Clear the parameter's set**

18.9.4. How to Use POP3 Specific Commands

AT&K3 OK	**hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",,, OK	**Set GPRS parameters (APN, login, password…)**
AT+KCNXTIMER=0,60,2,70 OK	**Set Timers**
AT+KCNXPROFILE=0 OK	**Activate GPRS profile**
AT+CGATT=1 OK	**Be sure to attach to the network**
AT+KPOPCNX="pop.domain.com", 580, "mylogin","mypassword"	**Connect the POP3 server URL is pop.domain.com at port 580.**
+KPOPCNX: **1**	**1 is the session id of current POP3 connection**
OK	***… Connection established …***
	Checkout available messages.
AT+KPOPLIST +KPOPLIST: 7 messages (214222 octets) +KPOPLIST: 1,1566 +KPOPLIST: 2,146257 +KPOPLIST: 3,7081 +KPOPLIST: 4,1190 +KPOPLIST: 5,28034 +KPOPLIST: 6,1191 +KPOPLIST: 7,28036	
OK	**Download mail #6**

AT+KPOPREAD=6 CONNECT *X-Apparently-To: receiver.addr@domain via 217.146.182.108; Fri, 04 May 2007 01:48:13 -0700<CRLF>* [...] *MIME-Version: 1.0<CRLF>* *from: mailmodule@yahoo.fr<CRLF>* *subject: TEST SMTP in MODE : SIMPLE<CRLF>* *to: receive.addrr@domain <CRLF>* *cc:* copy.addr@domain<*CRLF*> <*CRLF*> <*CRLF*> *Hello. This is a dummy MAIL text.<CRLF>* *If you read this, test is successful<CRLF>* <*CRLF*> <*EOF*> OK	**Note that header is modified by the SMTP server, this might induce heavier payload.** **… Start of body …** **<EOF> as the end of mail downloading.**
AT+KPOPDEL=6 OK	**Delete mail #6** **Check out list again:**
AT+KPOPLIST +KPOPLIST: 6 messages (213031 octets) +KPOPLIST: 1,1566 +KPOPLIST: 2,146257 +KPOPLIST: 3,7081 +KPOPLIST: 4,1190 +KPOPLIST: 5,28034 +KPOPLIST: 7,28036 OK	**The mail #6 has been marked as deleted**
AT+KPOPQUIT OK	**Close the connection with the POP3 server.** ***… Connection closed …***

18.10. Appendix 10: How to Use HTTP Client Specific Commands

AT&K3 OK	**hardware flow control activation**
AT+KCNXCFG=0,"GPRS","APN","log","password",”0.0.0.0”,”0.0.0.0”,”0.0.0.0” OK	**Set GPRS parameters (APN, login, password…)**
AT+KCNXTIMER=0,60,2,70 OK	**Set Timers**
AT+KCNXPROFILE=0 OK	**Activate GPRS profile**
AT+CGATT=1 OK	**Be sure to attach to network**
AT+KHTTPCFG=0,"www.google.com",80,1 +KHTTPCFG: 0 OK	**Set HTTP address, port number and http version**
AT+KHTTPHEADER=0 CONNECT Accept : text/html If-Modified-Since : Saturday, 15-January-2000 14:37:11 GMT OK	**Set the header of the request** **Send HTTP data after “CONNECT”. Do not forget the PATTERN characters. For example :** **“Data flow** **--EOF--Pattern--"**
AT+KHTTPGET=0, "/index.html" CONNECT HTTP/1.0 200 OK Cache-Control: private, max-age=0 Date: Tue, 24 Jun 2008 02:11:35 GMT Expires: -1 Content-Type: text/html; charset=ISO-8859-1 Set-Cookie: PREF=ID=ae1c663417e7799e:NW=1:TM=1214273495:LM=1214273495:S=5Uq9kExK4aTEv_cx; expires=Thu, 24-Jun-2010 02:11:35 GMT; path=/; domain=.google.com Server: gws Connection: Close <html><head><meta http-equiv="content-type" … a lot of data… OK	**Get the web page** **HTTP server response**
AT+KHTTPHEAD=0, "/index.html" CONNECT HTTP/1.0 200 OK Cache-Control: private, max-age=0 Date: Tue, 24 Jun 2008 02:11:35 GMT Expires: -1 Content-Type: text/html; charset=ISO-8859-1 Set-Cookie:	**Get the head of the web page** **HTTP server response**

PREF=ID=ae1c663417e7799e:NW=1:TM=1214273495:LM=1214273495:S=5Uq9kExK4aTEv_cx; expires=Thu, 24-Jun-2010 02:11:35 GMT; path=/; domain=.google.com Server: gws Connection: Close OK **AT+KHTTPPOST=0,, "/get.cgi"** CONNECT (…Data send…) HTTP/1.0 200 OK Content-Type: text/plain Context-Length: 37 Your data have been accepted. OK	**Send the data to the HTTP server** **Send HTTP data after "CONNECT"** **HTTP server response**

18.11. Appendix 11: How to Use SIM TOOLKIT

AT+CPIN="1234"	**Enter PIN CODE**
OK	
***PSSTK:"SETUP MENU",1,4,"SIMMAX",0,0,1,0,0,6**	**Soon the module sends an unsolicited message *PSSTK:"SETUP MENU" , it is the STK Setup menu**
AT*PSSTK="SETUP MENU",1,0	**There are 6 items in STK menu.**
OK	**Give response to URC "SETUP MENU". "1" is the Command Number. Send Terminal response, OK**
***PSSTK: "END SESSION"**	**URC for Session Status : End of STK session**
AT*PSSTK="GET ITEM LIST",6	**Use "GET ITEM LIST" command to get the list of items**
***PSSTK: "GET ITEM LIST",1,16,4,"Switch Number",0,0,0**	**Item 1: "Switch number".**
***PSSTK: "GET ITEM LIST",2,17,4,"Utilities",0,0,0**	**Item 2: "Utilities"**
***PSSTK: "GET ITEM LIST",3,18,4,"Auto Switch",0,0,0**	**Item 3: "Auto Switch"**
***PSSTK: "GET ITEM LIST",4,19,4,"Hidden Phone Book",0,0,0**	**Item 4:"Hidden Phone Book"**
***PSSTK: "GET ITEM LIST",5,20,4,"IP Call",0,0,0**	**Item 5: "IP Call"**
***PSSTK: "GET ITEM LIST",6,22,4,"Product Info.",0,0,0**	**Item 6:"Product Info"**
OK	
AT*PSSTK="MENU SELECTION",22	**Select menu 6, whose ItemIdentifier is 22. After this operation, it will enter into submenu of menu item 6.**
OK	
***PSSTK: "SELECT ITEM",0,0,"",0,0,1,0,0,2**	**Totally 2 menus in this level.**
AT*PSSTK="GET ITEM LIST",2	
***PSSTK: "GET ITEM LIST",1,1,4,"Customer service",0,0,0**	**Item 1 is "Customer service", no more sub menus**
***PSSTK: "GET ITEM LIST",2,2,4,"LOT",0,0,0**	**Item 2 is "LOT", no more sub menus**
OK	
AT*PSSTK="SELECT ITEM",1,1,0,0	**Select item 1 "Customer service", whose ItemIdentifier is 1**
OK	
***PSSTK: "DISPLAY TEXT",1,0,1,0,4,"http://www.sim-max.com/",0,0**	**URC "DISPLAY TEXT" info will be shown with Customer information, "http://www.sim-max.com/"**
AT*PSSTK="DISPLAY TEXT",1,0	**You have to use "DISPLAY TEXT" command to give a response to STK**
OK	
***PSSTK: "END SESSION"**	**URC for session status**

18.12. Appendix 12: How to Switch from Data Mode to Command Mode

AT+CPIN=”0000” **OK**	**Enter PIN CODE**
AT+CGDCONT=1,"IP","APN","0.0.0.0",0,0 **OK**	**Configure the GPRS parameters**
atd*99*1#** **CONNECT**	**Dial up to have a data connection**
~ÿ}#À!}!} } }2}!}$}%Ü}"}&} }*} } }#}$À#kZ~~ÿ}#À!}!}!} }2}!}$}%Ü}"}&} }*} } }#}$À#dJ~~ÿ}#À!}!}"} }2}!}$}%Ü}"}&} }*} } }#}$À#uz~ **----------** **OK**	**DATA exchanges (PPP)** **---- > Send “+++” characters** **Switch to command mode is done**
AT **OK**	**It is possible to use AT commands**
ato **CONNECT**	**Switch to data mode, resume the data connection**
~ÿ}#À!}!}#} }2}!}$}%Ü}"}&} }*} } }#}$À#zj~~ÿ}#À!}!}$} }2}!}$}%Ü}"}&} }*} } }#}$À#W}:~~ÿ}#À!}!}%} }2}!}$}%Ü}"}&} }*} } }#}$À#X}*~~ÿ}#À!}!}&} }2}!}$}%Ü}"}&} }*} } }#}$À#I:~~ÿ}#À!}!}'} }2}!}$}%Ü}"}&} }*} } }#}$À#F*~~ÿ}#À!}!}(} }2}!}$}%Ü}"}&} }*} } }#}$À#}3Ú~~ÿ}#À!}!}) } }2}!}$}%Ü}"}&} }*} } }#}$À#}<Ê~~ÿ}#À!}!}*} }2}!}$}%Ü}"}&} }*} } }#}$À#}-ú~ **NO CARRIER**	**DATA exchanges continue** **End of connection**

18.13. Appendix 13: How to Use MMS Specific Commands

We will explain how to send a MMS. In this example we consider a dummy mms file of ***252*** octets named ***mymms.bin***.

AT&K3 OK	**hardware flow control activation**
	… Configuration …
AT+KMMCNF=0,1 OK	**MMS notification activation**
AT+KMMCNF=1,"http://operator.mms.center" OK	**MMSC URL**
AT+KMMCNF=3,"MMS APN", "login", "password", Proxy IP address, 0 OK	**GPRS settings to access the network**
AT+KMMCNF=4,1 OK	**Preferred network access mode (Here GPRS only)**
AT+KPSD=,"MMS","ALL" OK	**Delete all previously stored MMS**
AT+KPSW="MMS",252 CONNECT	**Write the MMS in module memory**
Send mymms.bin through serial link	***Note that there is not <ETX> here, the module switch back to command mode when 252 octets are received. NO CARRIER is normal here***
NO CARRIER +KPSW: "53079300000008FF03E8"	**The module returns the amount of octets actually read and the index of the MMS in module memory**
AT+KPSSEND="53079300000008FF03E8" +KPSSEND: 1 OK	**Send the previously stored MMS**
	… The module connects the MMSC…
+KPSSR: "53079300000008FF03E8", 0, "4660", "Rat8pAqPv04AABLmAAAAFQAA9ZYAAAAA"	**Notification returns 0, the MMS is correctly sent, last two parameters represents the MMS IDs**

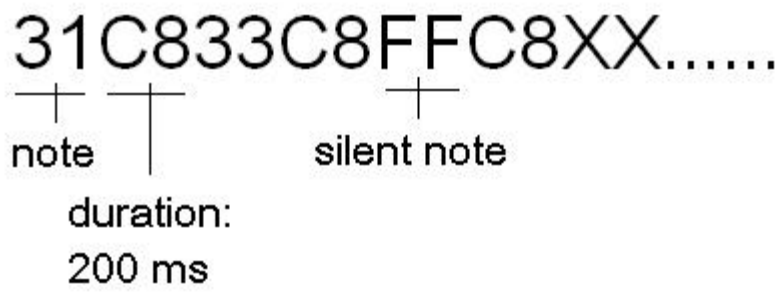
18.14. Appendix 14: How to Build an Audio File

The audio file (.snd) is a binary file. It contains two elements: note and duration (in ms). Sierra Wireless has defined 110 notes (tones) as following:

Note A2 , 110.00 Hz	Note 0x1	Note A6 , 1760.0 Hz	Note 0x31
Note A2# , 116.54 Hz	Note 0x2	Note A6# , 1864.7 Hz	Note 0x32
Note B2 , 123.47 Hz	Note 0x3	Note B6 , 1975.5 Hz	Note 0x33
Note C3 , 130.81 Hz	Note 0x4	Note C7 , 2093.0 Hz	Note 0x34
Note C3# , 138.59 Hz	Note 0x5	Note C7# , 2217.5 Hz	Note 0x35
Note D3 , 146.83 Hz	Note 0x6	Note D7 , 2349.3 Hz	Note 0x36
Note D3# , 155.56 Hz	Note 0x7	Note D7# , 2489.0 Hz	Note 0x37
Note E3 , 164.81 Hz	Note 0x8	Note E7 , 2637.0 Hz	Note 0x38
Note F3 , 174.61 Hz	Note 0x9	Note F7 , 2793.0 Hz	Note 0x39
Note F3# , 185.00 Hz	Note 0xa	Note F7# , 2960.0 Hz	Note 0x3a
Note G3 , 196.00 Hz	Note 0xb	Note G7 , 3136.0 Hz	Note 0x3b
Note G3# , 207.65 Hz	Note 0xc	Note G7# , 3322.4 Hz	Note 0x3c
Note A3 , 220.00 Hz	Note 0xd	Note A7 , 3520.0 Hz	Note 0x3d
Note A3# , 233.08 Hz	Note 0xe	Note A7# , 3729.3 Hz	Note 0x3e
Note B3 , 246.94 Hz	Note 0xf	Note B7 , 3951.1 Hz	Note 0x3f
Note C4 , 261.63 Hz	Note 0x10	Reserved for DTMF	Note 0x40~0x4f
Note C4# , 277.18 Hz	Note 0x11	Note, 425 Hz	Note 0x50
Note D4 , 293.67 Hz	Note 0x12	Note, 526 Hz	Note 0x51
Note D4# , 311.13 Hz	Note 0x13	Note, 1040 Hz	Note 0x52
Note E4 , 329.63 Hz	Note 0x14	Note, 1800 Hz	Note 0x53
Note F4 , 349.23 Hz	Note 0x15	Note, 1961 Hz	Note 0x54
Note F4# , 369.99 Hz	Note 0x16	Note, 2081 Hz	Note 0x55
Note G4 , 392.00 Hz	Note 0x17	Note, 480 Hz	Note 0x56
Note G4# , 415.30 Hz	Note 0x18	Note, 1400 Hz	Note 0x57
Note A4 , 440.00 Hz	Note 0x19	Note, 662 Hz	Note 0x58
Note A4# , 466.16 Hz	Note 0x1a	Note, 697 Hz	Note 0x59
Note B4 , 493.88 Hz	Note 0x1b	Note, 708 Hz	Note 0x5a
Note C5 , 523.25 Hz	Note 0x1c	Note, 770 Hz	Note 0x5b
Note C5# , 554.37 Hz	Note 0x1d	Note, 836 Hz	Note 0x5c
Note D5 , 587.33 Hz	Note 0x1e	Note, 852 Hz	Note 0x5d
Note D5# , 622.25 Hz	Note 0x1f	Note, 927 Hz	Note 0x5e
Note E5 , 659.26 Hz	Note 0x20	Note, 941 Hz	Note 0x5f
Note F5 , 698.46 Hz	Note 0x21	Note, 944 Hz	Note 0x60
Note F5# , 739.99 Hz	Note 0x22	Note, 950 Hz	Note 0x61
Note G5 , 783.99 Hz	Note 0x23	Note, 980 Hz	Note 0x62
Note G5# , 830.61 Hz	Note 0x24	Note, 999 Hz	Note 0x63
Note A5 , 880.00 Hz	Note 0x25	Note, 1212 Hz	Note 0x64
Note A5# , 932.33 Hz	Note 0x26	Note, 1307 Hz	Note 0x65
Note B5 , 987.77 Hz	Note 0x27	Note, 1324 Hz	Note 0x66
Note C6 , 1046.5 Hz	Note 0x28	Note, 2370 Hz	Note 0x67

Note C6# , 1108.7 Hz	Note 0x29	Note, 2613 Hz	Note 0x68
Note D6 , 1174.7 Hz	Note 0x2a	Note, 2831 Hz	Note 0x69
Note D6# , 1244.5 Hz	Note 0x2b	Note, 2998 Hz	Note 0x6a
Note E6 , 1318.5 Hz	Note 0x2c	Note, 3185 Hz	Note 0x6b
Note F6 , 1396.9 Hz	Note 0x2d	Note, 403 Hz	Note 0x6c
Note F6# , 1480.0 Hz	Note 0x2e	Note, 360 Hz	Note 0x6d
Note G6 , 1568.0 Hz	Note 0x2f	Silent Note	Note 0xff
Note G6# , 1661.2 Hz	Note 0x30		

To build up an audio file, just need to pick up a note, write into the audio file, next add a duration (convert it into HEX format) into the audio file. Just add like this pair by pair, until finish building. There is no space or tab between the note and the duration. So an audio file will be viewed as following (in HEX format):



The range value of the duration of a note is: 0x1-0xff (that is, max 255ms).

Note: *Only note 0x1-0x3f and 0x50-0x6d can be played, other invalid note will be ignored when playing.*

Note: *Audio file is a binary file. Add the data (in HEX format) into the audio file, do not add the char in ASCII into the text file.*

18.15. Appendix 15: Q and A for Advanced AT Commands

Q: How many sessions can be opened at the same time?

A: 8 sessions can be opened at the same time. But you can only have 1 FTP session at the same time.

For example: 1 FTP session, 1 FTP server and 6 TCP/UDP connections.

Q: Is it possible to have 1 UDP server and 1 TCP connection at the same time?

A: Yes.

Q: Is it possible to open 1 TCP server and 1 UDP server and 1 FTP server at the same time?

A: Yes. They can be opened at the same time.

Q: Is it possible to have FTP/SMTP/TCP/UDP session together?

A: Yes.

Q: Is it impossible to send a MMS when using FTP and TCP/UDP.

A: Yes

18.16. Appendix 16: ATH Command Behavior Table

ATH	**Channel specify (CMUX)**	**Voice Call**		**Data Call**		**GPRS call** (at*99***1#;at+CGDATA)		**SMTP / TCP / UDP / POP3 / FTP**	
		Active	Waiting	Active	Waiting	Active	Waiting	Active	Waiting
ATH / ATH0	OK	OK	OK	OK	OK	OK	OK	OK	OK
ATH1	ALL channel(CMUX)	OK	OK	OK	OK	OK	OK	OK	OK
ATH2	OK	NOK	NOK	OK	OK	NOK	NOK	NOK	NOK
ATH3	OK	NOK	NOK	NOK	NOK	OK	OK	OK	OK
ATH4	OK	OK	NOK	OK	NOK	NOK	NOK	NOK	NOK
ATH5	OK	NOK	OK	NOK	OK	NOK	OK	NOK	OK

18.17. Appendix 17: Switch data/command mode dtr +++ ato Behavior Table

The table shows the behavior when trying to switch mode:

Case1: "+++" is used to switch from data mode to command mode, and the service is suspended.

Case2: if AT&D1 is set, "DTR drop" is used to switch from data mode to command mode, but the service is suspended.

Case3: if AT&D2 is set, "DTR drop" is used to switch from data mode to command mode, and the service is stopped.

Case4: if AT&D0 is set, "DTR drop" has no any impact on the mode switch.

Case5: ATO[n] is used to switch from command mode to data mode.

	Case1/Case5 +++/ATO[n]	**Case2/Case5 DTR1/ATO[n]**	**Case3/Case5 DTR2/ATO[n]**	**Case4/Case5 DTR0**
TCP/UDP: +KTCPSND: Send data +KTCPRCV: Receive data +KUDPSND: Send data +KUDPRCV: Receive data +KTCPSTART: Direct data flow	OK/CONNECT	OK/CONNECT	NO CARRIER/NO CARRIER (disconnect)	NO IMPACT
SMTP/POP3: +KSMTPUL:Send a Mail +KPOPREAD: Download a Mail	OK/CONNECT	OK/CONNECT	NO CARRIER/NO CARRIER (disconnect)	NO IMPACT
FTP: +KFTPRCV: Download FTP files +KFTPSND: Upload FTP files	OK/NO CARRIER (disconnect)	OK/NO CARRIER (disconnect)	NO CARRIER/NO CARRIER (disconnect)	NO IMPACT
HTTP: +KHTTPGET: Get information +KHTTPHEAD: Get head of information +KHTTPPOST: Send data	OK/NO CARRIER (disconnect)	OK/NO CARRIER (disconnect)	NO CARRIER/NO CARRIER (disconnect)	NO IMPACT
MMS: +KPSR: Reading an Object +KPSW: Writing an object	OK/NO CARRIER (disconnect)	OK/NO CARRIER (disconnect)	NO CARRIER/NO CARRIER (abort)	NO IMPACT
+KFSFILE: Flash file operation	OK/NO CARRIER (abort)	OK/NO CARRIER (abort)	NO CARRIER/NO CARRIER (abort)	NO IMPACT
Data mode ATD*99… (use ATO or ATO0)	OK/CONNECT	OK/CONNECT	NO CARRIER/NO CARRIER (disconnect)	NO IMPACT

18.18. Appendix 18: Minimum Set of Data (MSD) Format

MSD format is defined in specification DD CEN/TS 15722:2011. MSD frame will be sent, presented in Abstract Syntax

Notation, ASN.1 Packed encoding rules (PER unaligned).

The following table describes the contents of the MSD frame.

M= Mandatory data field

0 = Optional data field, must be included even if no information is included.

Block No.	Name	Type	Unit		Description
1	ID	Integer		M	MSD format version set to 1 to discriminate from later MSD formats. Later versions have to be backwards compatible with existing versions. Systems receiving an MSD shall support all standardized MSD versions, which are each uniquely identified using an MSD format version parameter which shall always be contained in the first byte of all (current and future) MSD versions.
2	Message identifier	Integer		M	Message identifier, starting with 1 for each new eCall session and has to be incremented with every application layer MSD retransmission following a new 'send MSD' request after the incident event.
3	Control	Bit sequence		M	Bit 7: 1=Automatic activation 0=Manual activation Bit 6: 1=Test call 0=Emergency Bit 5: 1=Position can be trusted 0=No confidence in position Bit 4-0: Vehicle type encoding, e.g. 00001 = passenger vehicle (Class M1) 00010 = buses and coaches (Class M2) 00011 = buses and coaches (Class M3) 00100 = light commercial vehicles (Class N1) 00101 = heavy duty vehicles (Class N2) 00110 = heavy duty vehicles (Class N3) 00111 = motorcycles (Class L1e) 01000 = motorcycles (Class L2e) 01001 = motorcycles (Class L3e) 01010 = motorcycles (Class L4e) 01011 = motorcycles (Class L5e) 01100 = motorcycles (Class L6e) 01101 = motorcycles (Class L7e) Note 1 : Vehicle definitions class M, N according to directive 2007/46/EC; class L according directive 2002/24/EC. Note 2 : The position confidence bit is to be set to "Low confidence in position" if the position is not within the limits of +/- 150m with 95% confidence.

Block No.	Name	Type	Unit		Description
4	Vehicle identification	String		M	VIN number according ISO 3779 World Manufacturer Index (WMI) Vehicle Type Descriptor (VDS) Vehicle Identification Sequence (VIS)
5	Vehicle Propulsion storage type	Integer		M	These parameters identify the type of vehicle energy storage(s) present. 0 = indicates a type of storage not present 1 = indicates type of storage which is present All bits set to zero indicate an unknown type of energy storage. Bit 7: unused Bit 6: unused
5	Vehicle Propulsion storage type	Integer		M	Bit 5: 1 = hydrogen storage Bit 4: 1 = electric energy storage (with more than 42V and 100 Ah) Bit 3: 1 = liquid propane gas (LPG) Bit 2: 1 = compressed natural gas (CNG) Bit 1: 1 = diesel tank present Bit 0: 1 = gasoline tank present Note 1 This information may be unreliable if there has been a change of vehicle propulsion type (e.g. from gasoline to CNG). Note 2 More than one bit may be set if there is more than one type of energy storage present.
6	Timestamp	Integer	UTC sec	M	Timestamp of incident event. Seconds elapsed since midnight January 1st, 1970 UTC. Failure value for time stamp set to “0”.
7	Vehicle location	Integer	Milliseconds	M	Position latitude (WGS84) Value range (-324000000 to 324000000) Maximum value Latitude = 90°00’00.00” = 90*60*60.000” = 324000.000” = 324 000 000 Milliseconds = 0x134FD900 Minimum value Latitude = -90°00’00.00” = -90*60*60.000” = -324000.000” = -324 000 000 Milliseconds = 0xECB02700 Example 48°18’1.20” N = 48.3003333 lat = (48*3600)+(18*60)+1.20”=173881,200” Which encodes to the following value: = 173881200d=0x0A5D3770 If latitude is invalid or unknown, the value 0x7FFFFFFF shall be transmitted.

Block No.	Name	Type	Unit		Description
		Integer	Milliseconds	M	Position longitude (WGS84) Value range (-648000000 to 648000000) Maximum value Longitude = 180°00'00.00" = 180*60*60.000" = 648000.000" = 648 000 000 Milliseconds = 0x269FB200 Minimum value Longitude = -180°00'00.00" = -180*60*60.000" = -648000.000" = -648 000 000 Milliseconds = 0xD9604E00
7	Vehicle location	Integer	Milliseconds	M	Example 11°37'2.52" E = 11.6173666 long = (11*3600)+(37*60)+2.52"=41822.520" Which encodes to the following value: = 41822520d=0x027E2938 If longitude is invalid or unknown, the value 0x7FFFFFFF shall be transmitted.
8	Vehicle direction	Integer	2 degree	M	Direction of travel in 2 degrees steps from magnetic north (0-358, clockwise). If direction of travel is invalid or unknown, the value 0xFF shall be used.
9	Recent vehicle location n-1	Integer	100 milliseconds	O	Latitude delta (+ for North and – for South) with respect to Current Vehicle position in Block 7. 1 Unit = 100 milliseconds (WGS84), which is approximately 3m. Coded value range (-512..511) representing -51 200 to +51 100 milliseconds, or from 51,2"S to 51,1"N from the current position.
		Integer	100 milliseconds	O	Longitude delta (+ for East and – for West) with respect to Current Vehicle position in Block 7. 1 Unit = 100 milliseconds (WGS84), which is approximately 3m. Coded value range (-512..511) representing -51 200 to +51 100 milliseconds, or from 51,2"W to 51,1"E from the current position.
10	Recent vehicle location n-2	Integer	100 milliseconds	O	Latitude delta (+ for North and – for South) with respect to Recent Vehicle position n-1 in Block 9. 1 Unit = 100 milliseconds (WGS84), which is approximately 3m. Coded value range (-512..511) representing -51 200 to +51 100 milliseconds, or from 51,2"S to 51,1"N from the location represented by Recent Vehicle Location n-1.
		Integer	100 milliseconds	O	Longitude delta (+ for East and – for West) with respect to Recent Vehicle position in Block 9. Coded value range (-512..511) representing -51 200 to +51 100 milliseconds, or from 51,2"W to 51,1"E from the location represented by Recent Vehicle Location n-1.

Block No.	Name	Type	Unit		Description
11	No. of passengers	Integer		O	Minimum known number of fastened seatbelts, to be set to 0xFF or the optional parameter omitted if no information is available. Note This information is indicative only as it may be not always be reliable in providing exact information about the number of passengers (e.g. because seatbelts may not be fastened by passengers or for other reasons).
12	Optional additional data	String	Tbd	O	Further 103 bytes of data encoded as in ASN.1 definition. Note 1 ASN.1 provides already the indication of whether optional data is included by simply identifying the optional additional data field as optional. Note 2 Additional Data field may include an address where other relevant related data or functions are available.

Some fields of the MSD are set due to information from the DTE, others are set due to internal information of the module/NAD.

18.19. Appendix 19: Sleep mode Management

18.19.1. What is the sleep mode?

The sleep mode allows the module to be placed in a state of low energy consumption.

There are two levels of sleep mode:

- The first level is a high layers sleep mode. It means that the module cannot receive any AT commands.
- The second level is the deep sleep: it is when the module is turned off (use +CPOF or *PSCPOF AT commands) and only the real-time clock (RTC) is running (all GPIOs and signals are inactive). The module can be wakening up by the start hardware signal (pok-in) or by an alarm (see +CALA command). Note that the module is still power supplied by the host.

18.19.2. How to know if the module is in sleep mode?

When the module is in sleep mode the CTS signal is inactive.

The module is in deep sleep when all signals are inactive.

18.19.3. Sleep states

	+KSLEEP=0 (DTR control sleep)		+KSLEEP=1 (Auto sleep)	+KSLEEP=2 (Sleep forbidden)
	DTR active	DTR inactive		
USB is active (power on)	No sleep	No sleep	No sleep	No sleep
After module starts up	No sleep	Sleep after minimum 5s	Sleep after minimum 5s	No sleep

	+KSLEEP=0 (DTR control sleep)		+KSLEEP=1 (Auto sleep)	+KSLEEP=2 (Sleep forbidden)
	DTR active	DTR inactive		
No activity on the AT channels (even if a PDP context is opened or a channel is in data mode)	No sleep	Sleep	Sleep	No sleep
GPS active	No sleep	No sleep	No sleep	No sleep
Audio playback	No sleep	No sleep	No sleep	No sleep
No activity on Mux 07.10	No sleep	Sleep	Sleep	No sleep

18.19.4. Events that wake up the module

	+KSLEEP=0 (DTR control sleep)		+KSLEEP=1 (Auto sleep)	+KSLEEP=2 (Sleep forbidden)
	DTR active	DTR inactive		
Any URCs sent (voice call ring, sms, alarm, network…)	No sleep	Sleep, the urc is not sent	Wake up, the URC is sent	No sleep
Sent 0x00 character on the UART or USB (1)	No sleep	Sleep	Wake up	No sleep
Data received on the AT channels (data call, TCP, UDP…)	No sleep	Sleep	Wake up	No sleep
Toggle RTS signal(inactive to active or active to inactive)	No sleep	Sleep	Wake up	No sleep
Toggle DTR inactive to active	Wake up	Sleep	Wake up	No sleep
Toggle DTR active to inactive	-	Sleep	Sleep	No sleep

(1) After 0x00 wait for 100ms before sending any AT command

Management of the hardware flow control if AT&K3 and KSLEEP=1

When the module use AT+KSLEEP=1 (sleep mode auto) and the hardware flow control AT&K3 there are only two ways to wake up the module:

- To toggle the RTS signal.
- To active the USB (for HiLo3G and HiLoNC3GPS)

You cannot wake up the module by sending the character 0x00 on the UART because the CTS signal is inactive so it is blocked by the flow control.

18.19.5. Signals behaviors

18.19.5.1. GPIO signals

During sleep mode GPIO signals configured with +KSYNC are still generated.

18.19.5.2. Ri signal

During sleep mode Ri signal state changes according to +KRIC command.

18.19.5.3. DCD signal

DCD is active when a data call (CSD call, GPRS/3G, data on MUX, TCP, FTP, UDP…) is in progress even if the module is in sleep mode. After a "+++" DCD is INACTIVE, after ATO it becomes ACTIVE (if the data call is still active).

DCD is inactive if there is no data call at all.

18.19.5.4. CTS signal

CTS signal is always active when the module is not in sleep mode.

CTS signal is inactive when the module is in sleep mode.

18.19.5.5. DSR signal

DSR signal is always active when the module is power on.

18.19.5.6. Signals table

	No Sleep	**Sleeping state**
CTS	active	inactive
DSR	active	active
DCD	Active or inactive(*)	Active or inactive(*)
RI	Active or inactive(*)	Active or inactive(*)
GPIO	Active or inactive(*)	Active or inactive(*)

(*) the sleep mode state does not change the status of this signal

18.19.6. Management of DTR signal and AT&D option

	+KSLEEP=0 (DTR control sleep)		
	AT&D0	**AT&D1**	**AT&D2**
Any Voice calls in progress, Toggle DTR active to inactive	All voice calls are still active. The module goes in sleep mode. CTS signal is inactive. AT commands are not received.	All voice calls are still active. The module goes in sleep mode. CTS signal is inactive. AT commands are not received.	All voice calls are still active. The module goes in sleep mode. CTS signal is signal inactive. AT commands are not received.
Any data calls in progress, Toggle DTR active to inactive	All data calls are still active. The module goes in sleep mode. CTS signal is inactive. AT commands are not received.	All data calls are still active. "OK" is sent. Module is in command mode. The module goes in sleep mode. CTS signal is inactive. AT commands are not received.	All data calls are disconnected. "NO CARRIER" or disconnection URCs are sent. Module is in command mode. The module goes in sleep mode. CTS signal is inactive. AT commands are not received.

18.20. Appendix 20: Cause select values for AT*PSCSN

CauseSelect	Definition
0x00	No defined cause
0x10	Telecom stack internal cause (minor)
0x18	Telecom stack internal cause (blocking)
0x11	Terminal Equipment connected cause
0x19	Data Call Manager cause
0x1A	IP stack cause
0xB4	Telecom stack Data cause
0x41	Local cause (protocol)
0x42	Mobility Management cause (protocol)
0x43	Call Control (protocol)
0x44	Deregistration cause (protocol)
0x45	Radio Protocol cause]
0x46	CP cause
0x47	SIM card cause
0x48	Hardware cause
0x49	Problem in GPRS PDP activation
0xA1	Invocation message

CauseSelect	Definition
0xA3	SS return error message
0x80	SS reject general problem
0x81	SS reject invoke problem
0x82	SS reject result problem
0x83	SS reject error problem

Note: Many "cause" values can be associated with each "CauseSelect" value.. All "cause" values cannot be described in this document.

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18.21. Appendix 21: DATA ONLY mode (HiLo3g only)

This mode is only available for HiLo3G

18.21.1. What is it?

The DATA ONLY mode is a configuration to disable voice calls and voice features. Only data calls: circuit switch data and packet data calls work.

18.21.2. Activation

The activation can be only done in factory. A module configured in DATA ONLY mode cannot be "restored" in normal mode.

18.21.3. Behavior

The module is attached as a normal module to the network. The voice calls and features are blocked internally. The incoming voice calls are rejected.

18.21.3.1. Receive a voice call

A module configured in DATA ONLY mode cannot receive a voice call. If a device tries to make a voice call to the module, no RING message or hardware signal like Ri (ring indicator) are triggered.

The caller receives the message RELEASE CALL no cause from the network.

18.21.3.2. Try to make a voice call

ATD and ATD> commands

ATDxxxx; and ATD>xxxxx; commands returns NO CARRIER.

SIM Toolkit calls, PSSTK command

Voice calls initiated by the SIM Toolkit are rejected.

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